Fishery Management Report No. 08-06

Cook Inlet Area Groundfish Management Report 1996–2004

by

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Alaska Department of Fish and Game **Divisions of Sport Fish and Commercial Fisheries**

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Measures (fisheries)

fork length	FL
mideye-to-fork	MEF
mideye-to-tail-fork	METF
standard length	SL
total length	TL

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	*e*
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	*E*
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

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The Division of Sport Fish Fishery Management Reports series was established in 1989 for the publication of an overview of Division of Sport Fish management activities and goals in a specific geographic area. Since 2004, the Division of Commercial Fisheries has also used the Fishery Management Report series. Fishery Management Reports are intended for fishery and other technical professionals, as well as lay persons. Fishery Management Reports are available through the Alaska State Library and on the Internet: http://www.sf.adfg.state.ak.us/statewide/divreports/html/intersearch.cfm. This publication has undergone regional peer review.

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TABLE OF CONTENTS

Page

LIST OF TABLES ii

LIST OF FIGURES iii

LIST OF APPENDICES iii

ABSTRACT 1

INTRODUCTION 1

SABLEFISH 3

Historical Background 3
2004 Season Summary and Outlook 4
Harvest Monitoring 4

ROCKFISH 4

Historical Background 4
2004 Season Summary and Outlook 5
Harvest Monitoring 6

LINGCOD 7

Historical Background 7
2004 Season Summary and Outlook 8
Harvest Monitoring 8

PACIFIC COD 8

Historical Background 8
2004 Season Summary and Outlook 10
Harvest Monitoring 11

POLLOCK 12

Historical Background 12
Season Summary and Outlook 12
Harvest Monitoring 12

SKATES 12

Historical Background 12
2004 Season Summary and Outlook 13
Harvest Monitoring 13

OTHER GROUNDFISH 13

Historical Background 13
2004 Season Summary and Outlook 14
Harvest Monitoring 15

AT-SEA DISCARDS 15

CONCLUSIONS 15

REFERENCES CITED 17

TABLES AND FIGURES 19

APPENDIX A. 59

LIST OF TABLES

Table		Page
1.	Species encountered in Central Region groundfish management.	20
2.	Emergency orders issued for commercial groundfish fisheries in the Cook Inlet Area, 1996–2004.	21
3.	Landings and estimated exvessel values of Cook Inlet Area groundfish harvests, 1988–2004.	23
4.	Effort and harvest from the Cook Inlet Area commercial sablefish fishery, 1988–2004.	25
5.	Unweighted catch abundance during longline surveys in the North Gulf District, 1999–2002.	26
6.	Average weight, average length, and sex ratio of commercially harvested sablefish in the Cook Inlet Area, 1994–2004.	27
7.	Proportion of Cook Inlet commercial sablefish sampled at each size, 2000–2004.	28
8.	Effort and harvest by district of Cook Inlet Area commercial rockfish, including black rockfish from federal waters, 1988–2004.	29
9.	Harvest by assemblage of Cook Inlet Area commercial rockfish, including black rockfish from federal waters, 1988–2004.	30
10.	Species composition of pelagic shelf rockfish sampled in the Cook Inlet Area, 1996–2004.	31
11.	Average weight, average length, and sex ratio of commercially harvested black rockfish in the Cook Inlet Area, 1996–2004.	31
12.	Species composition of commercially harvested non-pelagic rockfish sampled in the Cook Inlet Area, 1996–2004.	32
13.	Commercial lingcod effort and harvest by gear type from the combined Cook Inlet area and adjacent federal waters, 1988–2004.	33
14.	Commercial lingcod harvest from state and federal waters, 1988–2004.	34
15.	Lingcod weight, length and percent female from Cook Inlet Area commercial catch samples, 1996–2004.	34
16.	Cook Inlet commercial Pacific cod season dates by gear type, 1997–2004.	35
17.	Commercial effort and harvest pooled between parallel and state waters Pacific cod seasons of the North Gulf and Cook Inlet Districts, 1988–2004.	36
18.	Effort and harvest in the commercial Pacific cod parallel season in the North Gulf and Cook Inlet Districts, 1988–2004.	37
19.	Effort and harvest by gear type in the Cook Inlet commercial Pacific cod parallel season, 1988–2004.	38
20.	Commercial effort and harvest for the state waters Pacific cod season in the North Gulf and Cook Inlet Districts, 1997–2004.	39
21.	Commercial effort and harvest (lb) by gear type with guideline harvest level (GHL) and percent harvest for the Cook Inlet state waters Pacific cod season, 1997–2004.	39
22.	Commercial pollock fishing effort and harvest in the Cook Inlet Area, 1988–2004.	40
23.	Average weight, average length, and percent female of commercially harvested walleye pollock in the Cook Inlet Area, 1994–2004.	41
24.	Commercial effort and harvest of other groundfish species from the Cook Inlet Area, 1988–2004.	42
25.	Reported at-sea discards from Cook Inlet Area groundfish fisheries, 1988–2004.	43
26.	Average weight and percent female of commercially harvested octopus in the Cook Inlet Area, 1994–2004.	44

LIST OF FIGURES

Figure **Page**

1. Boundaries of the Cook Inlet Area and the North Gulf District of the Central Gulf of Alaska Area prior to 1997. 45
2. Cook Inlet Area commercial groundfish area and district boundaries from 1997 to present. 46
3. Sablefish harvest and associated guideline harvest (GHL) level for the Cook Inlet fishery, 1988–2004. 47
4. Cook Inlet commercial sablefish sampled length frequencies, 2000–2004. 48
5. Commercial rockfish harvest contribution by gear type and rockfish species assemblage, 1988–2004. 49
6. Age frequency of black rockfish in commercial catch samples from the Cook Inlet Area, 1998–2004. 50
7. Yelloweye rockfish age frequency in commercial catch samples from the Cook Inlet Area, 2001–2004. 51
8. Lingcod length frequency from Cook Inlet commercial catch samples, 1998–2004. 52
9. Pacific cod catch by gear type in the Cook Inlet Area parallel (A) and state waters (B) seasons, 1988–2004. 53
10. Kachemak Bay groundfish pot closure area. 54
11. Kamishak Bay groundfish pot closure area. 55
12. Pacific cod length frequencies by district from Cook Inlet Area commercial Pacific cod samples, 1997–2004. 56
13. Walleye pollock relative length frequencies from Cook Inlet Area commercial catch samples, 1997–2004. 58

LIST OF APPENDICES

Appendix **Page**

A1. Frequently used acronyms and key words. 60

ABSTRACT

The Alaska Department of Fish and Game (ADF&G), Division of Commercial Fisheries manages all commercial groundfish fisheries within the Cook Inlet Area, defined as territorial waters from the shoreline to 3 nautical miles (nm) offshore located west of Cape Fairfield and north of the latitude of Cape Douglas. The Cook Inlet Area is divided into the Cook Inlet District, defined as Cook Inlet waters north of a line from Cape Douglas to Point Adam, and the North Gulf District, which comprises the remaining management area waters. In addition, ADF&G has management authority for lingcod *Ophiodon elongatus* and black rockfish *Sebastes melanops* in waters of the exclusive economic zone (EEZ) located adjacent to the Cook Inlet Area and from 3 nm offshore. Commercial groundfish fisheries, including harvests, effort, and regulations, are described for the Cook Inlet Area during the years 1988 to 2004. During 2004, the harvest among all groundfish totaled 3.1 million lb and generated an estimated exvessel value of $1.1 million. These fisheries were largely prosecuted by longline, jig, and pot gears. Total 2004 harvest and value are the greatest in the past 3 years but well below fishery yields in the mid- to late-1990s. Pacific cod *Gadus macrocephalus* has annually comprised the greatest economic yield from Cook Inlet Area commercial groundfish harvests since 1990. Sablefish *Anoplopoma fimbria* has generated the second highest annual exvessel value since 2000, based primarily on a high dockside price ($1.70/lb, round weight, in 2004). Rockfish and lingcod landings declined in 2004, although the fisheries remained open through the end of the year. Walleye pollock *Theragra chalcogramma* harvests totaled 342,000 lb in 2004, the largest landings since extensive directed fishing occurred in the Cook Inlet Area during 1996 to 1999. Several regulatory management changes through the period 1996–2004 are described for Cook Inlet Area commercial groundfish fisheries and recent regulatory changes based upon Alaska Board of Fisheries action during the 2004–2005 meeting cycle are summarized.

Key words: Cook Inlet, exvessel value, groundfish, harvest, management, lingcod, *Ophiodon elongates*, black rockfish, *Sebastes melanops*, Pacific cod, *Gadus macrocephalus*, sablefish, *Anoplopoma fimbria*, walleye Pollock, *Theragra chalcogramma*, yelloweye rockfish *Sebastes ruberrimus*.

INTRODUCTION

Historically defined as "waters north of a line from Point Adam to Cape Elizabeth to Cape Douglas", the Cook Inlet Area was redefined in 1996 by the Alaska Board of Fisheries (BOF). This change divided the North Gulf District, originally part of the "old" Central Gulf of Alaska Area, and added the western portion to the Cook Inlet Area (Figure 1). Today, the Cook Inlet Area includes territorial waters west of Cape Fairfield (148º 50.25' W. long.) and north of the latitude of Cape Douglas (58º 51.10' N. lat.) and is divided into two districts, Cook Inlet and North Gulf (Figure 2). The Cook Inlet District includes waters of Cook Inlet north of a line from Cape Douglas to Point Adam (59º 15.27' N. lat.) and the North Gulf District comprises the remaining waters of the management area, primarily the Gulf waters along the outer Kenai Peninsula. Commercial harvests reported here are representative of the current area definition.

The Alaska Department of Fish and Game (ADF&G), Division of Commercial Fisheries manages all commercial groundfish fisheries within the territorial waters of Cook Inlet, those waters from the shoreline to 3 nautical miles (nm) offshore. For territorial waters, the Alaska Board of Fisheries (BOF) establishes management regulations and ADF&G uses its emergency order authority to make adjustments to fishing time and area. The BOF schedules regular meetings for Cook Inlet groundfish on a triennial basis. Except for lingcod and black rockfish, the National Marine Fisheries Service (NMFS) manages groundfish resources in waters of the exclusive economic zone (EEZ), located from 3–200 nm offshore, under fishery management plans (FMP) developed by the North Pacific Fishery Management Council (NPFMC). In the EEZ, ADF&G manages fishing for any species not covered under the federal FMP.

Under state regulation, groundfish are defined as all marine finfish except halibut, osmerids, herring, and salmonids. Directed fisheries occur for several commercially important groundfish

including (Table 1): sablefish *Anoplopoma fimbria*, Pacific cod *Gadus macrocephalus*, walleye pollock *Theragra chalcogramma*, lingcod *Ophiodon elongatus*, skates *Raja sp.* and *Bathyraja sp.* and numerous rockfishes *Sebastes sp*. and *Sebastolobus sp.* State groundfish regulations also accommodate incidental groundfish bycatch from other directed groundfish, halibut, and salmon and herring gillnet fisheries. Some additional species landed as bycatch to directed groundfish fisheries include: spiny dogfish *Squalus acanthias*, Pacific sleeper shark *Somniosus pacificus*, salmon shark *Lamna ditropis*, majestic squid *Berryteuthis magister*, giant Pacific octopus *Octopus dofleini*, and skates *Bathyraja sp*. Statewide regulations adopted in 1997 prohibit directed commercial fishing for sharks (5AAC 28.084) and allow skate fishing only under a commissioner's permit (5AAC 28.083). Few flatfish landings have occurred, although numerous species of flatfish comprise a significant portion of the groundfish biomass within Cook Inlet waters (Bechtol 2001; Gustafson and Bechtol 2001).

Commercial groundfish harvests are primarily monitored inseason through ADF&G fish tickets (regulation 5AAC 39.130) with additional information derived from dockside sampling of the commercial catch, dockside interviews, and for some fisheries, logbooks. Dockside sampling involves the collection of biological data such as species, size, sex, gonad condition, and age structures and information on harvest location and effort. Prior to 2001, dockside sampling occurred on an opportunistic basis. Subsequently, through grant funding under the Alaska Fisheries Information Network (AKFIN), a groundfish sampling coordinator was hired and dockside sampling occurred more consistently. In Cook Inlet, reporting requirements specify that all groundfish retained but not delivered for sale, such as catch that is retained for personal use or used as bait at sea, must be reported on an ADF&G fish ticket. One of the most reliable means of improving fisheries management is through complete and accurate documentation of fisheries mortality, particularly reporting of all harvest removals.

Legal gear types for groundfish fishing in the Cook Inlet Area are longline, pelagic trawl, hand troll, mechanical jig, and pots. In most area fisheries, if more than one gear type is legal, only one gear type may be aboard at a time. Fishermen operating groundfish gear or groundfish tenders in Cook Inlet Area waters must have an area registration prior to fishing or tendering. Another area regulation establishes a 24-hour delivery period following the closure of a directed season. Some open groundfish seasons are established in regulation 5AAC 28.310. For many species, season openings are specified in regulation as calendar dates with season closures and other adjustments set by emergency order (Table 2). For Pacific cod, the parallel and state waters seasons established in regulation 5AAC 28.367 are opened by emergency order contingent upon management actions for the Pacific cod fishery in the adjacent federal Central Gulf of Alaska (CGOA). For a miscellaneous groundfish species that is not otherwise identified in regulation, the fishing season is established as a provision of the miscellaneous groundfish permit (regulation 5AAC 28.379), a regulation first effective in 1999.

This report summarizes annual harvests, in pounds (lb) and exvessel values for commercial groundfish fisheries during 1988–2004 (Trowbridge et al. 2001; Table 3), describes management changes, through the period 1996–2004, and summarizes recent regulatory changes based upon BOF action during it's 2004–2005 meeting cycle. Important groundfish fisheries are discussed in specific sections of this report.

SABLEFISH

HISTORICAL BACKGROUND

Cook Inlet sablefish harvests since 1988 have ranged from 2,996 lb in 1989 to 136,260 lb in 1988; effort ranged from 4 to 79 vessels (Table 4). During 2000–2003, harvest and effort averaged 117,040 lb and 19 vessels. The North Gulf District has yielded the majority of sablefish harvested while annual harvests from the Cook Inlet District have rarely exceeded 2,000 lb. In the North Gulf District, waters of Resurrection Bay, Aialik Bay, and in some years Day Harbor, have been the primary fishing areas. No sablefish have been landed from the Cook Inlet District since 1995.

The Cook Inlet Area sablefish fishery historically opened and closed on dates concurrent with the sablefish season in adjacent federal waters (Bechtol 1995b). Following implementation of the federal Individual Fishing Quota (IFQ) program in 1995 (Sigler et al. 2003), the Cook Inlet sablefish fishery became one of only two open-access sablefish fisheries in the state. Beginning in 1995, the Cook Inlet fishery opened concurrently with the IFQ sablefish fishery on March 15 and closed by emergency order based upon catch and catch rates. In 1997, the guideline harvest level (GHL) was set at the recent 5-year average sablefish harvest of 104,000 lb from the North Gulf District using the pre-1996 district boundaries. The fishery GHL has subsequently been adjusted each year in proportion to the percentage annual change in sablefish total allowable catch (TAC) set by NPFMC for federal waters of the CGOA. The TAC is based on biomass estimates generated from annual surveys conducted by NMFS in the Gulf of Alaska. These biomass estimates, and the corresponding TACs for the CGOA, declined annually from 1994 to 1999 (Sigler et al. 2003) and increased from 2000 to the present. Because sablefish in the Cook Inlet Area are believed to be part of the Gulf of Alaska stock, adjusting the state GHL proportional to changes in the CGOA TAC is a conservative approach to managing this historical nearshore fishery.

In response to complaints of harvest being misreported from adjacent federal waters, and testimony suggesting improved sablefish catch rates in nearshore waters later in the year, a public proposal to change the sablefish season opening date to July 15 was adopted by the BOF in 1998 and first implemented in 2000. Harvest data from 1988 to 1999 indicated the majority of the harvest occurred during May and June, supporting the increased catch rate claims (November 1998 Alaska Board of Fisheries Meeting, RC15).

Sablefish catch rates in the North Gulf District have varied annually (Table 4). Despite declines in NMFS biomass estimates and the corresponding decrease in the state fishery GHL, catch rates in the Cook Inlet Area sablefish fishery increased with the average pounds per landing increasing from 501 lb in 1995 to 8,721 lb in 2003. During this same period the number of vessels averaged 25 and ranged from 39 in 1997 to 14 in 2003 (Table 4). Although ADF&G attempted to adjust season duration in response to the catch rate increase, inseason data were inadequate to allow a timely response and the GHL was exceeded annually from 1999 to 2003 (Table 4; Figure 3). Season durations for 1996 to 1998 were 169 days, 134 days, and 35 days, respectively. Following the open season date change in 2000, season duration declined further to 11 days in 2000, 6 days in 2001, 3 days in 2002, and 2 days in 2003.

Federal and state regulations allow a sablefish IFQ holder to participate in the state managed sablefish fishery, provided the vessel catch does not exceed the allotted IFQ shares and the permit holders comply with both federal IFQ and state regulations. Similarly, individuals with

halibut IFQ may participate in the state managed sablefish fishery or retain sablefish as bycatch during the open sablefish season. Sablefish may not be retained from Cook Inlet state waters when the state managed fishery is closed.

A fishery-independent longline survey to assess sablefish stock status in the North Gulf District was conducted by ADF&G in Resurrection and Aialik Bays in 1999, Nuka Bay in 2000, and Day Harbor in 2002 (Table 5). The survey also provided data on non-target species, but was discontinued due to a lack of dedicated funding.

2004 Season Summary and Outlook

The 2004 Cook Inlet Area sablefish fishery opened for a 24-hour period 12:00 noon July 15 with an 87,000-lb fishery GHL. The harvest was monitored via fish tickets and frequent contacts with fish buyers. The catch totaled 82,836 lb from 17 landings by 17 vessels and marked the first year since 1999 that the GHL was not exceeded (Table 4). The average landing was approximately 4,873 lb; an amount less than the 2003 average of 8,721 lb, but greater than any other year on record. Greater catch rates may reflect the above-average recruitment of the 1997 and 1998-year classes in the Gulf of Alaska (Sigler et al. 2003). In contrast to earlier years, most vessels delivered whole sablefish, which facilitated biological sampling.

The BOF adopted a new regulation, the *Cook Inlet Sablefish Management Plan* (5AAC 28.360) that became effective for the 2005 fishery. Plan elements included a sablefish fishery registration requirement, logbook requirement, and 3,000-lb vessel trip limits within a 2-day period.

The 2005 Cook Inlet Area sablefish fishery opened July 15 with a GHL that is determined following an announcement of the federal TAC. Effort in the fishery is expected to remain stable and ADF&G will track harvest under the new management elements and attempts to provide up to 3 days notice of the closure.

Harvest Monitoring

Sablefish biological sampling did not occur between 1996 and 1999. During 2000 to 2004, dockside sampling yielded average sablefish lengths ranging from 57.1 to 61.7 cm and average weights ranging from 2.1 to 2.7 kg with a slightly decreasing trend in size from 2000 to 2004 (Table 6). Sex ratios between 2002 and 2004 remained fairly stable and ranged from 63% to 68% female. Length frequency distributions from 2000 to 2004 are shown in Table 7 and Figure 4.

ROCKFISH

Historical Background

Within the Cook Inlet Area, the North Gulf District has historically yielded greater than 95% of the commercial rockfish catch during any year and has supported active sport and personal use rockfish fisheries. The rocky, high-relief habitat typical of the North Gulf District is more suitable to nearshore rockfish than the glacial-mud substrate of the Cook Inlet District. Since 1988, the harvest ranged from 30,579 lb by 31 vessels in 1990 to 502,045 lb by 120 vessels in 1995 (Table 8). Pelagic shelf rockfish, particularly black rockfish taken primarily by jig gear, have comprised over 50% of the total harvest in most years (Bechtol 1998; Table 9; Figure 5). Demersal shelf rockfish, predominantly yelloweye rockfish *Sebastes ruberrimus* harvested by longline gear, has been the second most dominant assemblage and averaged 28% of the total annual catch since 1996. Since 2000, yelloweye harvest by jig gear has exceeded that harvested

by longline gear and increased annually from 3,700 lb in 2000 to 32,000 lb in 2003. Finally, slope rockfish species, predominantly represented by shortraker *Sebastes borealis* and rougheye *Sebastes aleutianus* rockfish, have comprised the smallest proportion of the harvest (Table 9; Figure 5).

Rockfish are managed via the *Cook Inlet Rockfish Management Plan* (5AAC 28.365), first implemented in 1993, which established a 150,000 lb fishery GHL for all rockfish species, provided for a bycatch fishery when the GHL was attained, and 5-day trip limits of 4,000 lbs for the North Gulf District and 1,000 lbs for the Cook Inlet Districts. From 1993 to 1996, rockfish opened to directed fishing January 1, closed when the 150,000-lb GHL was attained, and then reopened as a bycatch-only fishery for the balance of the year. In 1996, due to bycatch harvest levels that exceeded directed fishery removals in some years and a lack of stock abundance information, the BOF adopted a more conservative approach by making the 150,000-lb GHL a harvest cap rather than a "trigger" for opening the bycatch fishery. Management under the harvest cap approach, begun in 1997, proved problematic, as it required ADF&G to anticipate the amount of rockfish bycatch needed for other directed fisheries such as halibut and Pacific cod. In 1998, the NPFMC amended the pelagic rockfish assemblage, as defined in the federal Gulf of Alaska FMP, by removing black and blue rockfishes (DiCosimo et al. 1997). This action, requested by the state to address misreporting problems associated with the fishery, transferred management responsibility for these species in federal waters, to the State of Alaska (5AAC 28.010). Although blue rockfish has not been reported in the Cook Inlet Area, black rockfish is a pelagic species commonly found in the North Gulf District. Also in 1998, the BOF established a directed rockfish season opening date of July 1 and restricted gear for targeting rockfish to mechanical jig or hand troll (hand jig). The July 1 season opening date facilitated management by delaying the directed rockfish fishery until some of the non-rockfish fisheries were closed for the year and was concurrent with the directed lingcod season opening date. These measures were adopted to align the directed rockfish season with the lingcod season due to similarities in gear and species habitat requirements and to focus the directed fishery on black rockfish, rather than yelloweye rockfish that are more susceptible to overfishing. Since these changes went into effect, individual landings dominated by yelloweye rockfish, which are typically harvested by longline gear, have raised questions regarding the use of legal gear. In addition, changes in the commercial fishery species composition heightens concern about stock sustainability because demersal shelf rockfish, such as yelloweye, require a much longer rebuilding period than pelagic shelf rockfish (PSR) in the event of overfishing (Figure 5).

2004 Season Summary and Outlook

The 2004 rockfish harvest from the Cook Inlet Area was 118,089 lb from 114 landings by 60 vessels (Table 8). The directed season opened July 1 and remained open for the balance of the year. The harvest was composed of 72% black rockfish (84,656 lb), taken primarily by jig gears, followed by 27% yelloweye rockfish (32,494 lb) taken by jig and longline gears (Table 9). In contrast to recent years, most yelloweye rockfish (54%) were taken by longline gear rather than jig gear, and as bycatch to directed Pacific cod, sablefish, and halibut longline fisheries. Other species comprising the balance of the rockfish harvest included rougheye, shortraker, thornyhead *Sebastolobus alascanus*, quillback *Sebastes maliger*, tiger *Sebastes nigrocinctus*, silvergray *Sebastes brevispinis*, China *Sebastes nebulosus*, redstripe *Sebastes proriger*, chilipepper *Sebastes goodei* and dusky *Sebastes variabilis* rockfishes.

The BOF adopted significant changes to Cook Inlet rockfish regulations at the November 2004 meeting. These included restricting the directed fishery to PSR, a logbook requirement, and mandatory full retention and reporting of all rockfish caught. These regulations became effective for the 2005 fishery.

Since 2001, ADF&G has conducted a series of research projects to assess black rockfish populations within the North Gulf District (Byerly and Bechtol 2005; Byerly and Worton *In press*). The goal of these studies was to develop a standardized approach to index the abundance of black rockfish and associated species in nearshore waters. Initial surveys attempted to estimate local abundances of black rockfish in areas that may serve as long-term survey locations to monitor population trends. Mark–recapture and underwater scuba transects were used to estimate local abundances. Low recapture success and biases detected during scuba transects made these methods unusable. A follow-up study evaluated the use of hydroacoustic counts and mechanical jigging CPUE as low-cost methods to index the black rockfish population abundance on a management district scale. Mechanical jigging CPUE was found not to be a predictable index of abundance while hydroacoustic counts showed some promise and continued evaluation of this method may prove it an effective method.

The 2005 rockfish fishery opened January 1 to bycatch-only, with limits ranging from 5% to 20%, depending on the target species. The directed rockfish fishery opened by regulation on July 1 and closes when the total catch is around 130,000 lb. The balance of the 150,000 lb harvest cap provided for anticipated rockfish bycatch from other directed fisheries.

HARVEST MONITORING

Dockside sampling of PSR harvests did not occur during 1996 and 1997. Sampling of commercial landings from 1998–2004 indicated that black rockfish was the predominate species harvested in the directed fishery and comprised approximately 92% to 96% of the PSR harvest, with dusky rockfish (~4% to 8%) and yellowtail rockfish (less than 1%) making up the remainder of the harvest (Table 10). Species composition reported on fish tickets differed somewhat from dockside sampling indices suggesting a systematic under-reporting of dusky rockfish in landings of pelagic shelf rockfish. Average weight of black rockfish ranged from 2.0 to 2.5 kg with size decreasing from 1998 to 2000, and increasing through 2004 (Table 11). Black rockfish age data indicate the 1991 year class has been the most abundant component of the commercial harvest since the year 2000 (Figure 6).

Harvests of non-pelagic rockfish during this period were predominately bycatch to longline fisheries for halibut, sablefish and Pacific cod, with some harvest occurring in the directed rockfish and lingcod jig fisheries. Yelloweye rockfish made up the highest proportion (56%) of the sampled non-pelagic rockfish catch and was followed by rougheye (18%); quillback (8%); silvergray (7%); shortraker, thornyhead, and tiger (3% each); and canary (1%) rockfish (Table 12). Finally, all other rockfish species combined comprised 2% of the sampled catch. Age data for yelloweye rockfish show the 1969 year class has been the most abundant component of the commercial harvest since the year 2000 (Figure 7). There are insufficient sample sizes from other rockfish species to draw meaningful conclusions of age distribution.

LINGCOD

HISTORICAL BACKGROUND

Since 1988, Cook Inlet Area commercial lingcod harvests ranged from 2,894 lb in 1989 to 87,370 lb in 1993 (Table 13). Effort ranged from 10 vessels in 1989 to 84 vessels in 1992. The North Gulf District, which supports active commercial and recreational lingcod fisheries, has historically accounted for virtually all of the harvest. Lingcod harvest from the Cook Inlet District has been negligible, totaling only 1,295 lb since 1988. Harvest differences between districts are reflective of the relative amounts of suitable lingcod habitat. Interest in the directed lingcod fishery has been sporadic in recent years. For example, the fishery was open through the entire July 1–December 31 regulatory season during 1999, 2002, and 2003, but closed on August 30 in 2000, and October 22 in 2001.

In directed and bycatch fisheries during 1988 to 2003, harvest by gear type for jig, longline, and combined pot and trawl gears was 76%, 22%, and 2%, respectively (Table 13). Although harvest distribution prior to 1997 varied between state and federal waters, the majority of harvests since then have come from state waters (Table 14). In Central Region, the state first asserted management authority for lingcod in the EEZ in 1995. It is unknown whether subsequent changes in harvest distribution indicated shifts in relative abundance, harvest areas, or harvest reporting.

Directed fishing for lingcod was restricted to jig gears (hand/mechanical) beginning in 1999. Lingcod may be retained by other gear types at a 20% bycatch level only during the open directed season because survival of released fish is relatively high. In 1993, the BOF adopted regulatory season dates of July 1 to December 31 and a minimum size requirement of 35 inches overall or 28 inches measured from the front of the dorsal fin to the tip of the tail. The season dates close lingcod fishing during the first half of the year to protect spawning and nest-guarding lingcod at a time when they are particularly vulnerable to capture (Vincent-Lang and Bechtol 1992). The minimum legal size is intended to allow sexually mature lingcod to spawn in at least 2 successive years prior to being subjected to harvest removal.

From 1997 until 2002, the commercial lingcod fishery was managed for a 35,000 lb GHL that was established in 1997 as 50% of the recent 5-year harvest. ADF&G adopted this conservative approach due to a lack of lingcod abundance and biomass information, and evidence of localized recruitment failures, particularly in Resurrection Bay, during the early 1990s (Vincent-Lang and Bechtol 1992). Since 1993, Resurrection Bay has been closed to lingcod fishing, initially by emergency order and later by regulation, to protect depressed lingcod resources. The most recent surveys indicated little recruitment had occurred in this area (Bethe and Meyer 2002).

In 2002, ADF&G increased the allowable harvest to 52,500 lb, or 75% of the average harvest during 1992–1996. This increase in the GHL is consistent with the approach applied by NPFMC groundfish plan teams and for groundfish stocks in federal waters. Under Amendment 56 adopted by the NPFMC for the Bering Sea/Aleutian Groundfish Fishery Management Plan, a fishery is classified as a Tier 6 fishery if the only reliable assessment data are catch history. For a Tier 6 fishery, acceptable biological catch (ABC) is defined as 75% of the historical annual average harvest.

2004 Season Summary and Outlook

The 2004 directed and bycatch lingcod fisheries opened July 1 with a 52,500-lb GHL and remained open through December 31. Lingcod harvest from the Cook Inlet Area totaled 36,644 lb from 63 landings by 30 vessels (Table 13). Eight vessels fishing jig gear produced 85%, and 22 vessels fishing longline gear yielded the balance of the 2004 harvest. Although the jig harvest was the highest since 1998, directed lingcod effort in 2004 was low compared to the period 2000–2003 when the number of vessels ranged from 10 to 27. The increased fishery GHL adopted in 2002 has not yet been achieved.

During the 2004 meeting on Cook Inlet groundfish, the BOF adopted a regulation giving ADF&G emergency order authority to require, if necessary, that lingcod be landed with the head on and the vent intact to allow biological sampling of the catch. This change became effective in 2005.

The 2005 fishery opened July 1 with a GHL of 52,500 lb. It is difficult to predict performance in the coming seasons given the inconsistent fishing effort in recent years. ADF&G continues to actively pursue sampling of lingcod landings.

Harvest Monitoring

Dockside sampling of lingcod did not occur during 1996, 1997, and 1999. Between 1998 and 2003, information collected by dockside samplers included fishing location and effort as well as fish length, sex, and otoliths or fin rays for age determination. Sample data indicate average size declined slightly between 1998 and 2000, then increased steadily through 2004 (Table 15). External determination of sex was possible on many fish. However, most lingcod were delivered gutted and with the vent area removed, prohibiting collection of sex and maturity data on some fish and resulted in reduced sample sizes in some years. Female lingcod make up the majority of the harvest, averaging 65% and ranging from 51% to 77% across years (Table 15). Since mature female lingcod are significantly larger than male lingcod, length frequency distributions are bimodal with most males ranging from 88 to 105 cm and most females over 105 cm in length (Figure 8). Although most lingcod were delivered in a head-on condition, removal of the head by some fishers prevented collection of otoliths used to develop size-at-age and age-at-maturity. An experiment comparing ages estimated from otoliths and fin ray sections was conducted in 2001 through 2004 and the results are being analyzed.

PACIFIC COD

Historical Background

Historically the Cook Inlet commercial Pacific cod fishery was managed via emergency order to coincide with seasons in the adjacent federal CGOA. Adopted in November 1996 and first implemented in 1997, the *Cook Inlet Pacific Cod Management Plan* (5AAC 28.367) defines two seasons, a "parallel season" and a "state waters season." Similar to historical seasons, the parallel season is set by emergency order to coincide with the federal CGOA fishery for Pacific cod with respect to season dates and allowable gears, provided those gear types are legal in state waters, and is further guided by statewide regulation 5AAC 28.087. The state waters season occurs after the initial parallel season and is managed for a separate allocation. Dates for these seasons are listed in Table 16.

Since 1997, total Pacific cod removals in parallel and state waters seasons combined have ranged from approximately 1.5 million lb in 2001 to 4.7 million lb in 1999 (Table 17). While fishing with both jig and pot gears can be productive from late winter through late spring, the most effective period for jig gear has been the March to May period. Although ADF&G has only limited data on spring Pacific cod distributions in the Cook Inlet Area (Bechtol 2001), studies from other areas suggest that cod aggregate in major spawning areas during January through March, then migrate to shallower, nearshore waters as part of a spring post spawning migration (Shimada and Kimura 1994).

Parallel season Pacific cod annual harvest and effort during 1988–1997 ranged from 36,846 lb from 9 vessels in 1989 to approximately 5.4 million lb from 190 vessels in 1992 (Table 18). The parallel season harvest first exceeded 1.0 million lb in 1991 and averaged 3.3 million lb annually during 1991–2000 (Figure 9A). After 2000, parallel fishery harvests totaled less than 1.0 million lb annually, primarily due to a shift to the Kodiak Area by the local longline fleet. Historically, the majority of the harvest came from longline gear in the North Gulf District. However, the 1990s expansion of the pot fishery shifted the largest component of Pacific cod harvests to the Cook Inlet District where pot gear has taken 20–70% of the parallel season harvest in recent years (Bechtol 1995a; Trowbridge et al. 2001; Table 19). The 2003 parallel season Pacific cod harvest of 420,798 lb was the lowest since 1991.

State waters season Pacific cod harvests have ranged from 730,469 lb in 1998 to approximately 1.5 million lb in 1999; most of the harvest in all years came from the Cook Inlet District (Table 20). Although jig gear harvested 67% of the 1997 season harvest total, this occurred during the "implementation year" in which regulations became effective on April 3, only 4 days prior to the spring pot closure (Table 21; Figure 9B). Jig harvest fell to 26% of the 1998 harvest and averaged less than 2% of the harvest during 2000–2002; pots have remained the dominant gear in the fishery. After ADF&G enacted the new regulation by emergency order in 1999, the fishery harvested 1.5 million lb of a 2.6 million-lb GHL. Despite such regulatory adjustments, further supplemented by relaxation of the pot limits and an annual exclusive area registration requirement, and as provided in the management plan, the Cook Inlet state waters Pacific cod GHL was first achieved in 2003 (Figure 9B). The 2003 state waters season opened almost a month earlier than the 2001 or 2002 seasons and had the lowest GHL and highest pot catch per landing since inception of the fishery. Jig harvest also increased to 30% during 2003 due to the pot allocation being taken and most pot vessels shifting to jig gear during the spring.

The state waters season, begun in 1997, was designed to provide additional Pacific cod fishing opportunities for local vessels using pot or jig gear. The plan originally specified a state waters season that began 7 days following the closure of the parallel season and closed each time the federal CGOA directed Pacific cod season reopened (under parallel season rules) and a pot closure period of April 7 to June 15. This latter element addressed an industry concern for reduced quality of post-spawn product. Each of these original plan elements has been amended. In 2000, the 7-day closure between the parallel and state waters seasons, meant to ensure separation of the fisheries and facilitate accurate seasonal catch accounting, was reduced to 24 hours and the plan was further modified to enable the state waters season to remain open despite subsequent federal CGOA openings. Although the product quality concerns meant to be addressed by the pot closure period were not realized, the closure period was retained but reduced to May 1 to June 15 by BOF action in 1999. The closure was retained due to user

interest in ensuring fall season Pacific cod fishing opportunity while providing an additional 3 weeks of pot fishing time.

In 2001, the BOF recognized NMFS fishing gear closures for Pacific cod in critical habitat around the haulouts and rookeries of endangered Steller Sea lions (SSL) by giving the commissioner emergency order authority to adopt the federal closures surrounding these areas. As a result, fishing with longline or pot gear within 10 nm of Sugarloaf Island (within the Barren Islands group) and Outer Pye Island has been closed annually since 2001 via emergency order.

Beginning in 2002, the BOF also adopted the federal vessel monitoring system (VMS) requirement, for all parallel fisheries. This action was adopted to provide more precise location information in support of fishery enforcement efforts and protection for essential fish habitat and habitat areas of particular concern (HAPC).

Current elements of the state waters season include:

- Season opens by emergency order 24-hours following the closure of the initial federal season in the Central Gulf of Alaska area by NMFS;
- Exclusive area registration; stipulates a vessel may not validly register for more than one exclusive Pacific cod registration area during a state managed season;
- GHL calculated as 2.25% of the Central Gulf of Alaska acceptable biological catch (Thompson et al. 2003) and allocated equally between pot and jig gear;
- GHL increases to 3% and then 3.75%, upon attainment of the previous GHL in any year;
- Pot gear closure from May 1 to June 15;
- Gear limits of 5 jigs or 60 pots, with a pot buoy tag requirement;
- Allow full retention of pollock even when directed fishing is closed;
- When the directed rockfish fishery is closed, rockfish bycatch is reduced to 5% for vessels registered for the state Pacific cod season;
- If the jig allocation is not achieved before September 1, the balance of the allocation becomes available to pot gear; and
- Gear limits and the exclusive area registration requirement may be relaxed after October 30 if the department judges the action necessary to achieve the GHL.

Statewide regulations for groundfish pots specify a tunnel eye perimeter of 36 inches or less and a biodegradable escape panel in the pot wall. Area regulations specify localized closures to groundfish pots in portions of Kachemak and Kamishak Bays to protect depressed king crab stocks and rebuilding Tanner crab stocks (Figures 10 and 11; Bechtol et al. 2002). The Kachemak Bay pot closure regulation, partially defined by a depth contour, was amended in 2002 and defined by latitude and longitude coordinates. Limited onboard observer data from vessels using pot gear in Kachemak Bay, suggests this closure area achieves the goal of protecting crab in critical habitat.

2004 Season Summary and Outlook

The 2004 Cook Inlet Area parallel Pacific cod season was open January 1 through 12:00 noon January 31 with harvest and effort totaling 388,020 lb from 59 vessels, the lowest harvest since

1990 (Table 18). Similar to recent years, pot gear dominated the catch at 360,637 lb, 94% of the total harvest, a greater proportion than previous years due to a low level of longline effort (Table 19).

Due to attainment of the 2003 GHL and consistent with the management plan, beginning in 2004 the state waters Pacific cod allocation increased to 3% of the federal CGOA TAC. The 2004 fishery opened February 1 with a 2.37 million-lb GHL, divided equally between pot and jig gear. Pot gear catch and effort totaled approximately 1.79 million lb from 170 landings by 12 vessels (Table 21). The pot season closed February 23, the earliest date the pot allocation has been achieved since the fishery began (Table 16). Subsequently, many participants shifted to jig gear. Jig catch and effort totaled 326,298 lb from 120 landings by 18 vessels (Table 21). During the 2004 meeting, the BOF adopted several changes to state waters Pacific cod regulations that became effective during 2005. These changes included increasing the percent calculation for the GHL from 3.00 to 3.75, setting a harvest cap of 25% of the GHL for vessels greater than 58 ft in length, and new gear allocations of 75% for pot and 25% for jig gear.

The 2005 Cook Inlet Area parallel season for Pacific cod opened January 1 and coincided with inseason adjustments by NMFS for adjacent federal waters. The state managed season begins 24 hours after NMFS closes directed fishing for Pacific cod in the CGOA. When the ABC for the CGOA has been determined, ADF&G issues a news release describing the upcoming season's management. ADF&G plans to continue commercial catch sampling of Pacific cod.

HARVEST MONITORING

From 1996 through 2000, dockside sampling was conducted opportunistically as staff was available. The frequency of dockside sampling from 2001 to 2004 was increased with the addition of dedicated sampling staff. Information collected by dockside samplers included fishing location and effort as well as fish length, weight, sex, maturity stage and age structures. Samplers were also opportunistically placed on commercial fishing vessels as observers to collect location, biological and bycatch data.

Length frequency data have been collected each year from 1997 through 2004 during state-waters fisheries. Average weights were calculated from data collected by dockside samplers. Fish sampled from the North Gulf District averaged consistently larger than fish sampled from the Cook Inlet District. Length frequency distributions by year are shown in Figure 12.

Otoliths and other experimental age structures have been collected in some years, however age determination is problematic and age accuracy is unresolved at this time. Based on an analysis of statewide groundfish sample sizes (Carlile 2005), it was determined that since Pacific cod are assessed by NMFS and the Cook Inlet GHL is based on a percentage of the Gulf of Alaska ABC, it is not necessary to collect age structures in the state-waters fisheries as no age-based assessment is performed by ADFG.

Ancillary information on Pacific cod age, sex, size, and distribution is also collected during the annual trawl surveys in Kachemak and Kamishak Bays; survey results are reported under separate titles (Bechtol 2001).

POLLOCK

HISTORICAL BACKGROUND

Walleye pollock seasons in the Cook Inlet Area were historically managed via emergency order as parallel fisheries with state seasons set to coincide with NMFS actions in the adjacent waters of the federal EEZ. The cumulative reported pollock harvest from area state waters between 1987 and 1995 was 459,843 lb (Table 22). Directed pollock fishing with midwater trawls occurred in the North Gulf District during 1996–1999. Annual pollock harvest during these years ranged from approximately 1.9 million lb in 1996 to 9.7 million lb in 1998, with midwater trawls yielding over 99% of the harvest. Since mid 1999, directed fishing for pollock has required a commissioner's permit under 5AAC 28.379 *Permit for Miscellaneous Groundfish*. Due to lack of interest, no permits were issued through 2003. Limited deliveries of pollock also occur under regulation 5AAC 28.075, which was intended to encourage improved retention and utilization of pollock and Pacific cod, although regulatory compliance is believed poor. Temporal and geographical fishing restrictions associated with Steller sea lion protective measures complicated pollock harvesting opportunities beginning in 2000; effectively closing all of the North Gulf District to pollock trawl fishing. These measures are anticipated to continue in the future.

SEASON SUMMARY AND OUTLOOK

In 2004, ADF&G issued a single commissioner's permit to allow the pelagic trawl harvest of pollock. That vessel, in combination with deliveries of incidentally caught pollock by other vessels, resulted in a total 2004 pollock harvest of 342,305 lb (Table 22).

The BOF generated a proposal, #455 seeking to reestablish the Cook Inlet pollock trawl fishery in the Resurrection Bay area, which was tabled for later consideration pending comment from NMFS in regard to Steller sea lion protections. The proposal was scheduled for consideration during the March 2005 BOF meeting.

HARVEST MONITORING

In years of directed harvest (1997–1999 and 2004) walleye pollock were monitored through dockside and on-board observer sampling of commercial catches. Information collected by dockside samplers included fishing location and effort as well as fish length, weight, sex, maturity stage and otoliths for age determination. Average length ranged from 44 to 56 cm and average weight ranged from 0.9 to 2.3 kg. Sex ratios averaged 47% female and ranged from 43% to 54% female (Table 23). Length frequency distributions are shown in Figure 13.

SKATES

HISTORICAL BACKGROUND

Historically, skates were open to directed fishing with little regulatory oversight beyond general reporting requirements. Effective in May 1998, statewide regulation 5AAC 28.083 established a commissioner's permit requirement for directed skate fishing and permit conditions such as depth of fishing, season dates, fishing areas, minimum size limits, gear, logbooks, as well as other conditions the commissioner finds "necessary for conservation and management purposes".

Skate harvests in the Cook Inlet Area have varied over time and remained small, likely due to lack of market development and the relative abundance of more valuable species. Harvest from

1988–2003 ranged from 66 lb in 2000 to 62,381 lb in 1998 (Table 24). Most harvest has come from longline gear, much of it as bycatch to other directed groundfish and halibut fisheries and primarily during the months of February to April.

2004 Season Summary and Outlook

The first applications for permits to target skates in Cook Inlet were received in 2004. The department issued 9 permits and the harvest totaled 18,728 lb. Permits were valid for 90 days, restricted gear to longline or jig, required logbooks and 2-hour prior notice of landing, and agreement to carry an ADF&G observer upon request. Catch reporting by species was required and in 2004 ADF&G's fish ticket reporting system was amended to provide species codes to facilitate reporting of the two species most commonly harvested, longnose *Raja rhina* and big *Raja binoculata* skates. Big skates comprised approximately 97% of the landed harvest total. Declines in reported at-sea discards of skates has declined over the last decade, although similar to all nonretained catch, they remain poorly documented (Table 25).

Harvest Monitoring

Bycatch skate harvests during this period were monitored through fish ticket records. Directed skate harvests for year 2004 were monitored through fish ticket records, logbooks and dockside sampling of commercial catches. Information collected by dockside samplers included fish length, sex, weight and vertebrae for age determination. Age structures were shipped to the NMFS age lab in Seattle, final age estimates have not been received to date. Preliminary analysis indicates commercially harvested skates from the Cook Inlet area range from 8 to 22 years in age (Gburski et al. 2007). Species composition of the directed skate harvest sample was 97% big skate and 3% longnose skate. Female skates made up 73% of the harvest sampled. Big and longnose skates averaged 144 cm and 115 cm total length respectively. Average weight of skates delivered was 18.0 kg.

OTHER GROUNDFISH

Historical Background

Assorted species of flatfish, sharks, and other groundfish have been harvested in both directed and bycatch fisheries in the Cook Inlet Area (Table 24). Historically, for any groundfish species that lacked specific regulatory management measures, state waters fishing seasons were set by emergency order to coincide with NMFS fishing seasons in adjacent federal waters. However, due to the potential for rapidly expanding and uncontrolled fisheries on species for which there is little biological data, the BOF adopted a variety of regulatory measures allowing ADF&G and the BOF to take a precautionary approach toward new or rapidly developing fisheries.

Among the more pertinent measures adopted by the BOF are:

- 5AAC 28.089 - *Guiding Principles for Groundfish Fishery Regulations*
- 5AAC 39.210 - *Management Plan for High Impact Emerging Fisheries*
- 5AAC 28.084 - *Fishing Seasons, Landing Requirements, and Utilization for Sharks*
- 5AAC 28.379 - *Permit for Miscellaneous Groundfish*

Annual shark harvests from the Cook Inlet Area have ranged from no reported landings to 6,594 lb in 1999. In 1997, the BOF closed directed shark fishing, permitted retention of shark bycatch, and defined that a directed fishery for skates may only occur under the conditions of a

commissioner's permit. Directed shark fishing remains open in the EEZ. Little new biological information has become available since the 1997 BOF actions. Data that might be used to develop a state management plan, such as stock structure, biomass and abundance levels, existing fishing mortality, and ecological linkages, are still lacking. High annual variability of sharks in ADF&G surveys is consistent with current literature, which confirms most shark species are highly migratory (Berceli et al. 2002). Because few sharks are currently retained as allowed under current commercial regulations, the recent interest in shark fisheries does not appear related to increased market demand, but instead to reducing hook competition with other, more valuable, target species.

Incidental captures of shark species can approach nuisance levels, particularly spiny dogfish. Catch and discard mortality are poorly documented, but reportedly high, among the fishing fleet in some areas and at some times. Cook Inlet Area shark bycatch, comprised primarily of spiny dogfish as evidenced by reported at-sea discards, has increased over the past decade.

Octopus, which is defined as a miscellaneous shellfish in state regulations, is considered a groundfish species in federal regulation. While directed fishing for octopus never fully developed in the Cook Inlet Area, the bycatch of octopus, particularly from the pot fishery for Pacific cod, is significant. Octopus harvests ranged from no reported landings during 1988–1990 to 38,518 lb landed in 2002 (Table 24). An octopus management plan (5AAC 38.360), implemented in 2000, established a bycatch-only fishery with a bycatch limit of 20% and a GHL of 35,000 lb. Squid is also defined in state regulation as a miscellaneous shellfish and is reported here as a bycatch component of the pollock pelagic trawl fisheries. Squid landings peaked at 26,980 lb in 1998; no landings were reported after 1999.

2004 SEASON SUMMARY AND OUTLOOK

Reported harvest of other groundfish in 2004 in the Cook Inlet Area was 55,292 lb from 143 landings by 20 vessels (Table 24). Octopus (51%) and skates (48%) comprised 99% of the total other groundfish harvest. Despite the interest expressed in directed shark fishery development, no shark landings were reported in 2004, although discussions with the fishing fleet suggest incidental catch of sharks remains common in some areas.

Effective in 2005, a new regulation adopted by the BOF during 2004 allowed a directed spiny dogfish fishery via commissioner's permit. If interest develops, ADF&G will work with interested parties to draft the permit.

The NPFMC is currently reviewing a number of options concerning fishing mortality of miscellaneous groundfish species in federal waters. A Groundfish Plan amendment is being considered that would adopt shark-fishing restrictions for federal waters similar to those adopted by the BOF for state waters. In addition, the NPFMC is considering a Groundfish Plan Team proposal to reapportion the "other species" category into more discrete species groups, and providing each group with a given ABC and TAC as with longnose and big skates. Currently, miscellaneous species are lumped into the "other species" category and managed under an aggregate TAC that is set as a fixed percentage of the aggregate harvest biomass of all species for which TACs have been established. The current risk-prone approach could potentially allow a single species to be harvested up to the TAC established for the "other species" group in aggregate.

HARVEST MONITORING

Information collected by dockside samplers included octopus sex and weight. Average weight of octopus sampled was 13.4 kg (Table 26) with male octopus generally heavier than female. Female octopus made up 61% of the harvest.

AT-SEA DISCARDS

At-sea discards reported by vessels fishing in Cook Inlet Area waters ranged from 0 lb in 1988 to 138,236 lb in 1996 (Table 25). Sharks comprised the largest component, 90%, with sablefish and skates comprising the next largest components, 3% each, of all discards reported during 2004. Most reported discards come from NFMS and International Pacific Halibut Commission survey cruises with a smaller proportion coming from vessels carrying observers. Higher value species, such as sablefish, rockfish, and lingcod, typically have lower reported discards. Reporting of at-sea discards is somewhat dependent upon factors such as location and timing of fishery, changes to fishing technology, market conditions, requirements of vessel operator, etc. However, based on relative catch abundances observed in ADF&G surveys, actual discard rates are much higher than reported (Tables 5 and 13; Bechtol 2001; Gustafson and Bechtol 2001).

CONCLUSIONS

Groundfish resources in the Cook Inlet Area represent a wide array of species targeted by commercial, recreational, and subsistence users. Formal management plans or strategies have been adopted for some of the more commercially important species. However, limited data are available on which to base management decisions for many species with limited or poorly documented historical harvests. In addition, we typically have a poor understanding of the ecological linkages for such species. Thus, management strategies often involve actions that deliberately operate in concert with federal management strategies in adjacent federal waters, particularly when transboundary species are being considered. In this way, ADF&G can take advantage of biological information derived from NMFS stock assessments for adjacent federal waters.

While providing for directed fishing opportunities, it is also important to minimize resource waste by providing for retention of incidentally captured species, particularly when incidental captures are unavoidable. However, bycatch allowances must be sufficiently restrictive to serve as a disincentive to increasing the incidental capture.

Development of new fisheries, or increased harvests for existing species, can be accommodated through existing management plan development guidelines, including miscellaneous fisheries permits. These permits allow exploratory approaches to determine the economic and management viability of resource development without establishing exclusive fishing rights. However, it must be stressed that exploratory approaches place increased demands upon ADF&G staff for oversight and management and, in many cases; staff may be unable to commit the necessary resources for development of new fisheries. Furthermore, industry may be called upon to shoulder some of the expenses of project development. Above all, development of new fisheries will be contingent upon adequate biological information. New or expanding harvests that are significantly detrimental to the stock status of target or incidentally caught species will

not be approved. For this reason, it is critical that the industry participate as fully as possible in the information gathering process. One important part of this process is the complete and accurate documentation of fishery removals and fishery discards. A common misconception is that a particular removal, such as personal use, is insignificant. However, the cumulative impact of incremental removals can have biological significance on sustained yield management. In addition, accurate at-sea discard information provides data on relative encounter rates for many species that, while not retained at this time, may become economically important for future fisheries. Although some species of concern, such as sharks, have been discarded at sea by the industry for many years, the lack of documentation on relative encounter rates has impeded development of management strategies to provide for sustained yield. Resource management will continue to rely heavily on input from all user groups, and an increasing understanding and awareness of ecosystem impacts as a component of resource removal.

REFERENCES CITED

Bechtol, W. R. 1995a. The Pacific cod fishery in Cook Inlet: report to the Alaska Board of Fisheries. Alaska Department of Fish and Game, Division of Commercial Fisheries Management and Development, Regional Information Report 2A95-35, Anchorage.

Bechtol, W. R. 1995b. Commercial groundfish fisheries in the Cook Inlet and North Gulf Management Areas: 1995 report to the Alaska Board of Fisheries. Alaska Department of Fish and Game, Division of Commercial Fisheries Management and Development, Regional Information Report 2A95-42, Anchorage.

Bechtol, W. R. 1998. A synopsis of life history and assessment of Cook Inlet rockfish. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 2A98-40, Anchorage.

Bechtol, W. R. 2001. A bottom trawl survey for crabs and groundfish in the Southern, Kamishak, and Barren Islands Districts of the Cook Inlet Management Area, 19-23 July and 16-23 August 1999. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 2A01-05, Anchorage.

Bechtol, W. R., Trowbridge, C., and N. Szarzi. 2002. Tanner and king crabs in the Cook Inlet Management Area: stock status and harvest strategies. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 2A02-07, Anchorage.

Berceli, R., C. Trowbridge, M. A. Lambdin, and W. Dunne, and W. R. Bechtol. 2002. Review of groundfish fisheries in the Prince William Sound Management Area: 2002 report to the Alaska Board of Fisheries. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 2A02-33, Anchorage.

Bethe, M. L., and S. C. Meyer. 2002. A survey of lingcod in Resurrection Bay and the Chiswell Islands, Gulf of Alaska, 1998. Alaska Department of Fish and Game, Fishery Data Series No. 02-08, Anchorage. http://www.sf.adfg.state.ak.us/FedAidPDFs/fds02-08.pdf

Byerly, M. M and W. R, Bechtol. 2005. Evaluation of Scuba Assessment Methods for Shallow-Water, Nearshore Black Rockfish, *Sebastes melanops*. In: Fisheries Assessment and Management in Data-Limited Situations. Alaska Sea Grant College Program University of Alaska, Fairbanks.

Byerly, M. M. and C. Worton. *In prep*. Development of a Black Rockfish Population Index In: Nearshore Marine Research in Alaska (V): Final Comprehensive Progress Report. Alaska Department of Fish and Game, Division of Commercial Fisheries, Juneau.

Carlile, D. 2005. An Assessment of age determination needs and samples sizes for groundfish fisheries managed by the State of Alaska. Alaska Department of Fish and Game, Special Publication No. 05-12, Anchorage. http://www.sf.adfg.state.ak.us/FedAidPDFs/Sp05-12.pdf

DiCosimo, J., B. Bechtol, S. Meyer, K. Brix, A. Smoker, and D. Stockel. 1997. Environmental assessment/regulatory impact review for amendment 46 to the fishery management plan for the groundfish fishery of the Gulf of Alaska to revise management authority of pelagic shelf rockfish. North Pacific Fisheries Management Council, 605 W. Fourth Ave., Suite 306, Anchorage, AK 99501.

Gburski, C. M., S. K. Gaichas, and D. K. Kimura. 2007. Age and growth of big skate (*Raja binoculata*) and longnose skate (*R. rhina*) in the Gulf of Alaska. Environmental Biology of Fishes 80:337-349.

Gustafson, R. L., and W. R. Bechtol. 2001. Trawl shrimp index surveys in the Southern District of the Cook Inlet Management Area, spring 1995 and 1997. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 2A01-09, Anchorage.

Shimada, A. M., and D. K. Kimura. 1994. Seasonal movement of Pacific cod, *Gadus macrocephalus*, in the eastern Bering Sea and adjacent waters based on tag-recapture data. Fishery Bulletin 92:800-816.

Sigler, M. F., C. R. Lunsford, J. T. Fujioka, and S. A. Lowe. 2003. Sablefish assessment for 2004. In: Stock assessment and fishery evaluation report for the groundfish resources of the Gulf of Alaska. Prepared by the Gulf of Alaska Groundfish Plan Team, North Pacific Fisheries Management Council, Anchorage.

Thompson, G. W., H. H. Zenger, and M. W. Dorn. 2003. Chapter 2 - Assessment of the Pacific cod stock in the Gulf of Alaska. *In:* Stock assessment and fishery evaluation report for the groundfish resources of the Gulf of Alaska. Prepared by the Gulf of Alaska Groundfish Plan Team, North Pacific Fisheries Management Council, Anchorage.

REFERENCES CITED (Continued)

Trowbridge, C., W. R. Bechtol, M. A. Lambdin, and W. Dunne. 2001. Cook Inlet Area groundfish report to the Alaska Board of Fisheries, 2001. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 2A01-18, Anchorage.

Vincent-Lang, D., and W. R. Bechtol. 1992. Current status and recommendations for the future management of the lingcod stocks of the Central Gulf of Alaska: a report to the Alaska Board of Fisheries, October 1992. Alaska Department of Fish and Game, Anchorage.

TABLES AND FIGURES

Table 1.–Species encountered in Central Region groundfish management.

ADF&G Species Code	Common Name	Scientific Name
710	Sablefish	*Anoplopoma fimbria*
110	Pacific Cod	*Gadus macrocephalus*
270	Walleye Pollock	*Theragra chalcogramma*
130	Lingcod	*Ophiodon elongatus*
870	Giant Pacific Octopus	*Octopus dofleini*
875	Majestic Squid	*Berryteuthis magister*
692	Pacific Sleeper Shark	*Somniosus pacificus*
690	Pacific Salmon Shark	*Lamna ditropis*
691	Spiny Dogfish	*Squalus acanthias*
700	Other Skates	*Family Rajidae*
701	Longnose Skate	*Raja rhina*
702	Big Skate	*Raja binoculata*
NA	Assorted Flatfishes	*Order Pleuronectiformes*
Pelagic Shelf Rockfish		
142	Black Rockfish	*Sebastes melanops*
155	Yellowtail Rockfish	*Sebastes flavidus*
172	Dusky Rockfish	*Sebastes variabilis*
173	Dark Rockfish	*Sebastes ciliatus*
Demersal Shelf Rockfish		
138	Copper Rockfish	*Sebastes caurinus*
145	Yelloweye Rockfish	*Sebastes ruberrimus*
146	Canary Rockfish	*Sebastes pinniger*
147	Quillback Rockfish	*Sebastes maliger*
148	Tiger Rockfish	*Sebastes nigrocinctus*
149	China Rockfish	*Sebastes nebulosus*
150	Rosethorn Rockfish	*Sebastes helvomaculatus*
Slope Rockfish		
136	Northern Rockfish	*Sebastes polyspinis*
137	Bocaccio Rockfish	*Sebastes paucispinis*
141	Pacific Ocean Perch	*Sebastes alutus*
151	Rougheye Rockfish	*Sebastes aleutianus*
152	Shortraker Rockfish	*Sebastes borealis*
153	Redbanded Rockfish	*Sebastes babcocki*
157	Silvergray Rockfish	*Sebastes brevispinis*
158	Redstripe Rockfish	*Sebastes proriger*
159	Darkblotched Rockfish	*Sebastes crameri*
166	Sharpchin Rockfish	*Sebastes zacentrus*
182	Splitnose Rockfish	*Sebastes diploproa*
176	Harlequin Rockfish	*Sebastes variegatus*
143	Shortspine Thornyhead	*Sebastolobus alascanus*

Table 2.–Emergency orders issued for commercial groundfish fisheries in the Cook Inlet Area, 1996–2004.

Emergency Order Number	Effective Date	Explanation
2004		
2-GF-H-06-04	11/9/04	Removed exclusive area registration and gear limits for state waters Pacific cod season.
2-GF-H-05-04	9/1/04	Reopened pot gear and removed gear allocations in the state waters Pacific cod season.
2-GF-H-04-04	7/15/04	Opened the sablefish season for 24-hours at 12:00 noon July 15.
2-GF-H-03-04	2/23/04	Closed the state waters Pacific cod season to pot gear.
2-GF-H-02-04	1/31/04	Closed the parallel Pacific cod fishery and opened the state waters season for Pacific cod at 12:00 noon February 1.
2-GF-H-01-04	1/1/04	Opened the parallel Pacific cod fishery at 12:00 noon.
2003		
2-GF-H-07-03	12/8/03	Closed state waters Pacific cod season.
2-GF-H-06-03	10/23/03	Closed directed rockfish season.
2-GF-H-05-03	9/1/03	Removed gear allocations for state waters Pacific cod season.
2-GF-H-04-03	7/15/03	Set a 12:00 noon opening for a 48-hour sablefish season.
2-GF-H-03-03	2/27/03	Closed state waters Pacific cod season for pot gear.
2-GF-H-02-03	2/9/03	Closed parallel and opened state waters Pacific cod season.
2-GF-H-01-03	1/1/03	Opened parallel Pacific cod season.
2002		
2-GF-H-06-02	10/31/02	Removed exclusive area registration and gear limits for state waters Pacific cod season.
2-GF-H-05-02	8/20/02	Closed directed rockfish season.
2-GF-H-04-02	8/5/02	Closed state waters Pacific cod season for pot gear and set September 1 date to reopen.
2-GF-H-03-02	7/15/02	Set a 12:00 noon opening for a 72-hour sablefish season.
2-GF-H-02-02	3/9/02	Closed parallel and opened state waters Pacific cod seasons.
2-GF-H-01-02	1/1/02	Opened parallel Pacific cod season.
2001		
2-GF-H-07-01	10/31/01	Removed exclusive area registration and gear limits for state waters Pacific cod season.
2-GF-H-06-01	10/22/01	Closed the lingcod season.
2-GF-H-05-01	8/29/01	Closed directed rockfish season.
2-GF-H-04-01	7/12/01	Closed the sablefish season.
2-GF-H-03-01	3/4/01	Closed parallel and opened state waters Pacific cod seasons.
2-GF-H-02-01	2/26/01	Closed longline gear in the parallel Pacific cod season.
2-GF-H-01-01	1/1/01	Opened parallel Pacific cod season.
2000		
2-GF-H-07-00	10/31/00	Removed exclusive area registration and gear limits for state waters Pacific cod season.
2-GF-H-06-00	9/1/00	Removed gear allocations for state waters Pacific cod season.
2-GF-H-05-00	8/30/00	Closed the lingcod season.

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Table 2.–Page 2 of 2.

Emergency Order Number	Effective Date	Explanation
2-GF-H-04-00	8/21/00	Closed directed rockfish season.
2-GF-H-03-00	7/26/00	Closed the sablefish season.
2-GF-H-02-00	3/4/00	Closed parallel and opened state waters Pacific cod seasons.
2-GF-H-01-00	1/1/00	Set some groundfish seasons as parallel with those in EEZ.
1999		
2-GF-H-08-99	10/31/99	Removed exclusive area registration and gear limits for state waters Pacific cod season.
2-GF-H-07-99	10/5/99	Closed parallel and opened state waters Pacific cod seasons.
2-GF-H-06-99	7/1/99	Reopened the directed rockfish season.
2-GF-H-05-99		Skipped number.
2-GF-H-04-99	5/19/99	Closed the sablefish season.
2-GF-H-03-99	4/7/99	Changed pot closure date from April 7 to May 1.
2-GF-H-02-99	3/21/99	Closed the directed rockfish season.
2-GF-H-01-99	3/21/99	Opened state waters Pacific cod season.
1998		
2-GF-H-07-98	1/1/99	Set some groundfish seasons to coincide with those in EEZ.
2-GF-H-06-98	10/31/98	Removed exclusive area registration and gear limits for state waters Pacific cod season.
2-GF-H-05-98	10/12/98	Closed the lingcod season.
2-GF-H-04-98	4/19/98	Closed the sablefish season.
2-GF-H-03-98	4/1/98	Closed the directed rockfish season, set bycatch limit.
2-GF-H-02-98	3/17/98	Opened the state waters Pacific cod season.
2-GF-H-01-98	1/1/98	Set some groundfish seasons to coincide with those in EEZ.
1997		
2-GF-H-07-97	10/24/97	Closed the lingcod season.
2-GF-H-06-97	10/31/97	Removed exclusive area registration and gear limits for state waters Pacific cod season.
2-GF-H-05-97	6/23/97	Closed the sablefish season.
2-GF-H-04-97	5/20/97	Reduced allowable rockfish bycatch to 10%.
2-GF-H-03-97		Skipped number
2-GF-H-02-97	5/4/97	Closed directed rockfish and set bycatch limits.
2-GF-H-01-97	4/4/97	Opened state waters Pacific cod season.
1996		
2-GF-H-06-96	10/17/96	Closed Resurrection Bay to lingcod fishing.
2-GF-H-05-96	9/1/96	Closed the sablefish season.
2-GF-H-04-96	5/6/96	Closed directed rockfish season and set bycatch limits.
2-GF-H-03-96		Skipped number
2-GF-H-02-96	1/1/96	Established closed areas to groundfish pots.
2-GF-H-01-96	1/1/96	Set some groundfish seasons to coincide with those in EEZ.

Table 3.–Landings and estimated exvessel values of Cook Inlet Area groundfish harvests, 1988–2004.

	Sablefish	Rockfish	Lingcod	Pacific Cod	Pollock	Other Species	Total
1988 Harvest							
Round Wt (lb)	136,252	213,242	24,948	517,372	2,380	2,819	897,013
Price ($/lb)	$1.02	$0.12	$0.22	$0.21	$0.08	$0.21	
Value	$139,421	$26,307	$5,487	$107,970	$193	$587	$279,965
1989 Harvest							
Round Wt (lb)	2,996	81,042	2,894	36,846	250	234	124,262
Price ($/lb)	$0.71	$0.07	$0.37	$0.07	$0.00	$0.15	
Value	$2,116	$5,662	$1,058	$2,587	$0	$34	$11,457
1990 Harvest							
Round Wt (lb)	8,480	30,580	6,769	378,799	61,817	2,309	488,754
Price ($/lb)	$0.55	$0.29	$0.36	$0.13	$0.07	$0.03	
Value	$4,631	$8,930	$2,432	$49,851	$4,441	$65	$70,350
1991 Harvest							
Round Wt (lb)	103,597	223,795	62,183	1,916,636	5,698	34,649	2,346,558
Price ($/lb)	$0.48	$0.20	$0.24	$0.27	$0.09	$0.33	
Value	$49,533	$44,971	$15,134	$513,991	$534	$11,556	$635,719
1992 Harvest							
Round Wt (lb)	126,852	357,626	42,218	5,435,932	949	8,799	5,972,376
Price ($/lb)	$0.69	$0.25	$0.22	$0.23	$0.05	$0.20	
Value	$87,269	$89,927	$9,434	$1,250,924	$45	$1,732	$1,439,331
1993 Harvest							
Round Wt (lb)	95,016	189,396	87,370	3,654,838	149,875	14,489	4,190,984
Price ($/lb)	$0.87	$0.32	$0.43	$0.24	$0.09	$0.46	
Value	$83,002	$59,947	$37,498	$880,826	$13,007	$6,636	$1,080,916
1994 Harvest							
Round Wt (lb)	45,008	401,964	56,836	2,685,389	237,429	18,201	3,444,827
Price ($/lb)	$1.38	$0.42	$0.38	$0.19	$0.00	$0.31	
Value	$62,097	$168,348	$21,690	$511,595	$0	$5,585	$769,315
1995 Harvest							
Round Wt (lb)	22,551	501,680	77,176	4,403,644	1,445	7,854	5,014,350
Price ($/lb)	$2.06	$0.58	$0.46	$0.24	$0.00	$0.72	
Value	$46,489	$291,247	$35,865	$1,045,991	$3	$5,683	$1,425,278
1996 Harvest							
Round Wt (lb)	81,067	191,087	59,296	4,630,742	1,940,506	204,735	7,107,433
Price ($/lb)	$1.94	$0.58	$0.52	$0.24	$0.09	$0.07	
Value	$157,502	$111,450	$30,951	$1,105,026	$171,700	$14,298	$1,590,927

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Table 3.–Page 2 of 2.

1997 Harvest							
Round Wt (lb)	125,349	217,364	32,147	4,112,154	3,870,099	104,010	8,461,123
Price ($/lb)	$2.33	$0.59	$0.47	$0.27	$0.09	$0.21	
Value	$292,635	$128,461	$15,135	$1,105,001	$344,807	$21,958	$1,907,997
1998 Harvest							
Round Wt (lb)	69,689	76,649	41,239	3,413,622	9,682,978	150,417	13,434,633
Price ($/lb)	$1.43	$0.53	$0.47	$0.24	$0.08	$0.10	
Value	$99,800	$40,816	$19,368	$810,160	$744,006	$15,254	$1,729,404
1999 Harvest							
Round Wt (lb)	76,741	87,652	28,162	4,681,310	2,983,234	140,897	7,997,995
Price ($/lb)	$1.52	$0.58	$0.50	$0.37	$0.09	$0.07	
Value	$116,481	$50,499	$13,981	$1,724,949	$262,032	$9,662	$2,177,604
2000 Harvest							
Round Wt (lb)	103,662	158,572	33,517	2,719,984	448	25,488	3,041,631
Price ($/lb)	$2.04	$0.49	$0.58	$0.41	$0.08	$0.49	
Value	$211,022	$77,010	$19,395	$1,105,020	$37	$12,479	$1,424,963
2001 Harvest							
Round Wt (lb)	133,435	116,323	40,793	1,511,103	3,129	24,630	1,829,413
Price ($/lb)	$1.77	$0.40	$0.51	$0.39	$0.07	$0.49	
Value	$235,581	$46,741	$20,782	$586,390	$206	$11,989	$901,689
2002 Harvest							
Round Wt (lb)	108,966	111,508	20,177	2,220,817	1,381	38,934	2,401,783
Price ($/lb)	$1.98	$0.55	$0.58	$0.33	$0.07	$0.42	
Value	$215,613	$60,878	$11,621	$732,505	$102	$16,267	$1,036,986
2003 Harvest							
Round Wt (lb)	122,098	142,729	27,154	1,870,889	21	29,528	2,192,419
Price ($/lb)	$2.21	$0.53	$0.60	$0.37	$0.00	$0.39	
Value	$269,355	$75,816	$16,306	$686,979	$00	$11,468	$1,059,924
2004 Harvest							
Round Wt (lb)	82,836	118,089	36,644	2,499,704	342,305	55,292	3,134,870
Price ($/lb)	$1.70	$0.49	$0.57	$0.37	$0.07	$0.15	
Value	$140,580	$57,389	$20,933	$811,610	$23,739	$8,200	$1,062,451

Note: Prices and values are derived from fish ticket information.

Table 4.–Effort and harvest from the Cook Inlet Area commercial sablefish fishery, 1988–2004.

Year	Vessels	Landings	Commercial Harvest [a]	ADF&G Survey [b]	Total Harvest	GHL [c]	CPUE
			Round Weight (lb)				(lb/landing)
1988	37	86	136,260		136,260		1,566
1989	4	5	2,996		2,996		599
1990	22	24	8,480		8,480		339
1991	25	33	103,597		103,597		3,139
1992	79	103	126,852		126,852		1,208
1993	36	52	95,016		95,016		1,827
1994	39	56	45,008		45,008		790
1995	33	45	22,551		22,551		501
1996	25	79	81,067		81,067	32,000–172,000	1,013
1997	39	97	125,349		125,349	72,000	1,279
1998	29	57	69,689		69,689	72,000	1,223
1999	23	40	73,695	3,046	76,741	63,400	1,842
2000	16	31	102,639	1,023	103,662	67,000	3,207
2001	21	32	133,435		133,435	67,000	4,170
2002	23	26	108,117	849	108,966	67,000	4,158
2003	14	14	122,098		122,098	75,000	8,721
2004	17	17	82,836		82,836	87,000	4,873

[a] Does not include reported at-sea discards.

[b] Sablefish caught during the longline assessment survey and sold to defray survey costs.

[c] Prior to the implementation of the federal IFQ program, sablefish seasons were set to coincide with federal sablefish seasons and an annual state water GHL was not established.

Table 5.–Unweighted catch abundance during longline surveys in the North Gulf District, 1999–2002.

	Pacific Cod	Arrowtooth Flounder	Flathead Sole	Dover Sole	Thornyhead Rockfish	Rougheye Rockfish	Pacific Halibut	Wrymouth	Walleye Pollock	Spiny Dogfish	Pacific Sleeper Shark	Longnose Skate	Bathyraja Skate	Sablefish	Tanner Crab	Starfish	Defective Hooks	Unbaited Hooks	Baited Hooks
1999 Resurrection and Aialik Bays (n=9 stations)																			
Abundance	379	19	4	0	2	2	110	3	13	19	4	35	42	611	2	1	191	153	4,485
% of Catch	30.4%	1.5%	0.3%	0.0%	0.2%	0.2%	8.8%	0.2%	1.0%	1.5%	0.3%	2.8%	3.4%	49.0%	0.2%	0.1%	15.3%	12.3%	
Number/Set	42.1	2.1	0.4	0.0	0.2	0.2	12.2	0.3	1.4	2.1	0.4	3.9	4.7	67.9	0.2	0.1	21.2	17.0	498.3
Variance	1,089.1	3.1	0.5	0.0	0.2	0.2	99.2	0.5	1.3	10.6	0.5	10.1	6.5	1314.1	0.4	0.1	228.9	116.8	1727.3
2000 Nuka Bay (n=12 stations)																			
Abundance	466	169	2	1	0	36	58	1	48	17	7	33	48	199	2	8	287	350	6,368
% of Catch	42.6%	15.4%	0.2%	0.1%	0.0%	3.3%	5.3%	0.1%	4.4%	1.6%	0.6%	3.0%	4.4%	18.2%	0.2%	0.7%	26.2%	32.0%	
Number/Set	38.8	14.1	0.2	0.1	0.0	3.0	4.8	0.1	4.0	1.4	0.6	2.8	4.0	16.6	0.2	0.7	23.9	29.2	530.7
Variance	2,604.5	65.4	0.2	0.1	0.0	13.1	14.3	0.1	10.4	2.1	1.0	23.3	33.3	320.4	0.2	0.8	601.2	2,860.9	3,764.6
2002 Day Harbor (n=6 stations)																			
Abundance	204	30	0	4	0	12	14	0	75	59	0	25	127	286	0	11	108	285	2,810
% Catch	24.1%	3.5%	0.0%	0.5%	0.0%	1.4%	1.7%	0.0%	8.9%	7.0%	0.0%	3.0%	15.0%	33.8%	0.0%	1.3%			
Number/Set	34.0	5.0	0.0	0.7	0.0	2.0	2.3	0.0	12.5	9.8	0.0	4.2	21.2	47.7	0.0	1.8	18.0	47.5	468.3
Variance	2046.0	3.2	0.0	0.3	0.0	16.0	3.1	0.0	248.7	19.0	0.0	8.5	122.2	338.3	0.0	4.7	124.8	3,393.9	10,986.7

Table 6.–Average weight, average length, and sex ratio of commercially harvested sablefish in the Cook Inlet Area, 1994–2004.

Year	Average weight (kg)	n	Average length (cm)	n	Percent female	n
1994	n/a		n/a		n/a	
1995	n/a		n/a		n/a	
1996	n/a		n/a		n/a	
1997	n/a		n/a		n/a	
1998	n/a		n/a		n/a	
1999	n/a		n/a		n/a	
2000	2.7	199	61.7	199	n/a	
2001	2.3	100	57.1	180	n/a	
2002	2.6	47	59.9	398	68%	397
2003	2.1	367	57.5	439	62%	439
2004	2.3	460	60.0	500	63%	498

Table 7.–Proportion of Cook Inlet commercial sablefish sampled at each size, 2000–2004.

	Proportion of Sampled Fish at each Length				
Length (cm)	2000	2001	2002	2003	2004
40	0.031	0.000	0.000	0.000	0.000
42	0.000	0.000	0.000	0.000	0.000
44	0.000	0.000	0.010	0.000	0.000
46	0.005	0.011	0.030	0.000	0.002
48	0.021	0.039	0.033	0.023	0.006
50	0.046	0.062	0.051	0.043	0.014
52	0.051	0.112	0.043	0.128	0.056
54	0.067	0.135	0.028	0.178	0.114
56	0.046	0.180	0.102	0.164	0.124
58	0.077	0.140	0.084	0.093	0.104
60	0.067	0.090	0.173	0.093	0.145
62	0.082	0.062	0.117	0.057	0.124
64	0.087	0.101	0.117	0.059	0.110
66	0.113	0.011	0.086	0.082	0.064
68	0.082	0.011	0.048	0.046	0.062
70	0.051	0.022	0.018	0.011	0.026
72	0.056	0.017	0.013	0.009	0.020
74	0.041	0.000	0.013	0.011	0.014
76	0.041	0.006	0.010	0.000	0.008
78	0.010	0.000	0.018	0.002	0.002
80	0.026	0.000	0.008	0.000	0.002

Table 8.–Effort and harvest by district of Cook Inlet Area commercial rockfish, including black rockfish from federal waters, 1988–2004.

Year	Vessels	Landings	Cook Inlet District	North Gulf District	Federal Waters	Total Harvest [a, b, c]
			Round Weight (lb)			
1988	44	102	2,859	148,227	62,213	213,298
1989	12	31	0	22,762	58,298	81,060
1990	31	41	401	29,807	371	30,579
1991	62	161	272	222,993	557	223,822
1992	121	408	1,029	334,149	23,699	358,877
1993	86	292	2,641	68,176	118,579	189,396
1994	74	277	110	205,451	196,480	402,040
1995	120	406	4,190	270,351	227,504	502,045
1996	124	343	700	120,776	75,101	196,577
1997	130	369	3,269	179,763	34,332	217,364
1998	110	303	10	72,888	7,423	80,321
1999	95	285	0	86,007	1,645	87,652
2000	96	243	0	133,431	25,978	159,409
2001	76	166	38	109,175	7,110	116,323
2002	71	158	7	106,637	4,864	111,508
2003	64	135	117	142,208	404	142,729
2004	60	114	246	117,843	0	118,089

[a] Includes reported at-sea discards.

[b] Data combined from ADF&G Neptune and Venus fish ticket software applications.

[c] Differences in harvest totals are due to rounding.

Table 9.–Harvest by assemblage of Cook Inlet Area commercial rockfish, including black rockfish from federal waters, 1988–2004.

	Demersal Shelf		Pelagic Shelf		Slope		Total
Year	Pounds (lb)	Percent of total	Pounds (lb)	Percent of total	Pounds (lb)	Percent of total	Pounds (lb)
1988	5,536	3	148,326	70	59,436	28	213,298
1989	10,376	13	69,046	85	1,639	2	81,060
1990	1,252	4	21,751	71	7,577	25	30,580
1991	7,217	3	190,212	85	26,392	12	223,822
1992	126,726	35	217,379	61	14,772	4	358,877
1993	27,802	15	155,780	82	5,814	3	189,396
1994	35,074	9	354,263	88	12,704	3	402,040
1995	37,812	8	454,241	90	9,992	2	502,046
1996	38,999	20	150,201	76	7,376	4	196,577
1997	49,809	23	153,139	70	14,417	7	217,364
1998	24,268	30	45,361	56	10,692	13	80,321
1999	46,129	53	32,298	37	9,225	11	87,652
2000	24,229	15	127,021	80	8,159	5	159,409
2001	26,894	23	83,608	72	5,821	5	116,323
2002	36,171	32	72,439	65	2,898	3	111,508
2003	44,808	31	96,367	68	1,554	1	142,729
2004	32,819	28	84,883	72	387	<1	118,089
Average	33,878	24	144,489	76	11,697	6.2	190,064

Note: Differences in harvest totals are due to rounding. Includes reported at-sea discards.

Table 10.–Species composition of pelagic shelf rockfish sampled in the Cook Inlet Area, 1996–2004.

	Black		Dusky		Yellowtail	
Year	n	%	n	%	n	%
1996	n/a		n/a		n/a	
1997	n/a		n/a		n/a	
1998	361	91.6%	32	8.1%	1	0.3%
1999	311	94.0%	20	6.0%	0	
2000	723	95.9%	31	4.1%	0	
2001	446	92.1%	37	7.6%	1	0.2%
2002	441	94.6%	25	5.4%	0	
2003	485	94.0%	28	5.4%	3	0.6%
2004	532	91.7%	48	8.3%	0	

Table 11.–Average weight, average length, and sex ratio of commercially harvested black rockfish in the Cook Inlet Area, 1996–2004.

Year	Average Weight (kg)	n	Average Length (cm)	n	Percent Female	n
1996	n/a		n/a		n/a	
1997	n/a		n/a		n/a	
1998	2.4	111	52	361	n/a	
1999	2.3	67	48	311	49%	59
2000	2.0	510	47	723	53%	590
2001	2.1	229	49	440	47%	390
2002	2.4	180	50	441	60%	331
2003	2.3	369	49	481	62%	451
2004	2.5	468	50	532	66%	469

Table 12.–Species composition of commercially harvested non-pelagic rockfish sampled in the Cook Inlet Area, 1996–2004.

	Thornyhead		Yelloweye		Canary		Quillback		Tiger		Rougheye		Shortraker		Silvergray		Other	
Year	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
1996	n/a		n/a		n/a		n/a		n/a		n/a		n/a		n/a		n/a	
1997	n/a		n/a		n/a		n/a		n/a		n/a		n/a		n/a		n/a	
1998	n/a		n/a		n/a		n/a		n/a		n/a		n/a		n/a		n/a	
1999	23	6%	77	21%	5	1%	58	16%	3	1%	86	24%	32	9%	55	15%	23	6%
2000		0%	49	56%	2	2%	21	24%	1	1%	7	8%	2	2%	4	5%	1	1%
2001	17	8%	80	38%		0%	6	3%		0%	95	45%	6	3%	8	4%		0%
2002		0%	136	74%		0%		0%	31	17%	15	8%		0%	1	1%	1	1%
2003		0%	204	88%	1	0%		0%		0%	15	6%		0%	12	5%	1	0%
2004		0%	141	95%		0%	7	5%		0%		0%		0%		0%		0%

Table 13.–Commercial lingcod effort and harvest by gear type from the combined Cook Inlet area and adjacent federal waters, 1988–2004.

			Jig/Troll	Longline	Other [a]	Total Harvest [b]
Year	Vessels	Landings	Round weight (lb)			
1988	16	37	6,512	16,172	2,264	24,948
1989	10	20	399	2,495	0	2,894
1990	22	22	1,306	5,227	236	6,769
1991	31	96	57,691	1,666	2,827	62,184
1992	84	192	6,998	34,071	1,149	42,218
1993	18	64	86,724	646	0	87,370
1994	14	30	56,505	331	0	56,836
1995	43	72	72,489	4,101	586	77,176
1996	39	58	47,986	11,307	3	59,296
1997	34	49	17,572	14,375	200	32,147
1998	23	41	27,284	13,602	353	41,239
1999	41	66	10,741	15,809	1,612	28,162
2000	41	72	29,488	4,029	0	33,517
2001	33	73	29,472	11,264	57	40,793
2002	33	64	16,383	3,714	80	20,177
2003	30	63	23,124	4,030	0	27,154
2004	30	63	31,009	5,635	-	36,644

[a] "Other" includes gear such as pot, trawl, or salmon gillnet.

[b] Does not include reported at-sea discards.

Table 14.–Commercial lingcod harvest from state and federal waters, 1988–2004.

	Commercial Harvest		
	State Waters	Federal Waters	Total Harvest [a]
Year	Round weight (lb)		
1988	18,362	6,586	24,948
1989	1,833	1,060	2,894
1990	2,496	4,272	6,769
1991	59,196	2,987	62,184
1992	24,460	17,558	42,218
1993	7,627	79,743	87,370
1994	21,782	35,054	56,836
1995	44,314	32,862	77,176
1996	29,461	29,835	59,296
1997	30,948	1,199	32,147
1998	39,781	1,458	41,239
1999	19,841	8,320	28,162
2000	26,524	6,992	33,517
2001	30,184	10,609	40,793
2002	18,664	1,513	20,177
2003	24,864	2,290	27,154
2004	35,632	1,012	36,644

[a] Does not include reported at-sea discards.

Table 15.–Lingcod weight, length and percent female from Cook Inlet Area commercial catch samples, 1996–2004.

	Weight		Length		Percent	
Year	(kg)	n	(cm)	n	female	n
1996	n/a		n/a		n/a	
1997	n/a		n/a		n/a	
1998	14.1	304	110	304	67	156
1999	n/a		n/a		n/a	
2000	13.2	26	108	26		
2001	13.5	188	109	188	51	69
2002	14.3	152	111	152		
2003	14.8	83	113	83	66	56
2004	15.5	155	115	155	77	108

Table 16.–Cook Inlet commercial Pacific cod season dates by gear type, 1997–2004.

Year	Dates and Times [a]	Season and Gears
1997	January 1–March 11; October 2–26	Parallel seasons
	April 4–October 2; October 26–December 31	State season jigs
	April 4–7; June 15–October 2; October 26–December 31	State season pots
1998	January 1–March 1; October 5–9	Parallel seasons
	March 17–October 5; October 9–December 31	State season jigs
	March 17–April 7; June 15–October 5; October 9–December 31	State season pots
1999	January 1–March 14; September 1–October 5	Parallel seasons
	March 21–September 1; October 5–December 31	State season jigs
	March 21–May 1; June 15–September 1; October 5–December 31	State season pots
2000	January 1–March 4	Parallel seasons
	March 5–December 31	State season jigs
	March 5–May 1; June 15–December 31	State season pots
2001	January 1–February 26	Parallel season, longline gear
	January 1–March 4	Parallel season, pot/jig gears
	March 5–December 31	State season jigs
	March 5–May 1; June 15–December 31	State season pots
2002	January 1–March 9	Parallel season
	March 10–December 31	State season jigs
	March 10–May 1; June 15–August 5; September 1–December 31	State season pots
2003	January 1–February 9; bycatch till September 9 then closed to retention	Parallel season
	bycatch until noon 9/9/2003 (no retention after this time)	State season jigs
	February 10–December 8 (5:00 pm)	State season pots
	February 10–27 (5:00 pm); September 1–December 8 (5:00 pm)	State season pots
2004	January 1–31	Parallel season
	February 1–December 31	State season jigs
	February 1–23 (5:00 pm); September 1–December 31	State season pots

[a] All season openers and closures occurred at noon unless otherwise noted.

Table 17.–Commercial effort and harvest pooled between parallel and state waters Pacific cod seasons of the North Gulf and Cook Inlet Districts, 1988–2004.

	North Gulf District			Cook Inlet District			Pooled Districts
Year [a]	Vessels	Landings	Harvest (lb)	Vessels	Landings	Harvest (lb)	Harvest (lb)
1988	28	79	303,778	38	135	213,719	517,497
1989	7	18	29,256	4	4	7,590	36,846
1990	19	26	158,654	34	101	220,145	378,799
1991	79	158	980,178	77	331	936,458	1,916,636
1992	155	611	4,656,230	50	257	785,191	5,441,421
1993	89	265	2,752,450	29	162	909,294	3,661,744
1994	52	160	1,482,618	30	226	1,202,944	2,685,562
1995	112	255	3,014,296	50	415	1,394,355	4,408,651
1996	94	300	3,807,762	24	271	837,183	4,644,945
1997	123	371	2,341,596	66	574	1,770,558	4,112,154
1998	116	387	2,287,116	40	428	1,126,942	3,414,058
1999	104	311	2,462,855	51	476	2,238,230	4,701,085
2000	85	235	1,077,475	39	515	1,659,703	2,737,178
2001	73	135	330,292	30	319	1,180,811	1,511,103
2002	51	103	747,964	24	441	1,472,853	2,220,817
2003	42	83	779,063	28	361	1,095,273	1,874,336
2004	52	119	1,051,440	43	305	1,448,264	2,499,704

[a] All harvest totals include reported at-sea discards.

Table 18.–Effort and harvest in the commercial Pacific cod parallel season in the North Gulf and Cook Inlet Districts, 1988–2004.

	North Gulf District			Cook Inlet District			Pooled Districts		
Year	Vessels	Landings	Harvest (lb) [a]	Vessels	Landings	Harvest (lb)	Vessels [b]	Landings	Harvest (lb)
1988	28	79	303,778	38	135	213,719	59	213	517,497
1989	7	18	29,256	4	4	7,590	9	21	36,846
1990	19	26	158,654	34	101	220,145	52	127	378,799
1991	79	158	980,178	77	331	936,458	122	489	1,916,636
1992	155	611	4,656,230	50	257	785,191	190	868	5,441,421
1993	89	265	2,752,450	29	162	909,294	109	427	3,661,744
1994	52	160	1,482,618	30	226	1,202,944	74	386	2,685,562
1995	112	255	3,014,296	50	415	1,394,355	140	669	4,408,651
1996	94	300	3,807,762	24	271	837,183	106	567	4,644,945
1997	109	290	2,050,031	39	286	1,223,209	137	576	3,273,240
1998	93	295	2,122,576	27	224	561,013	116	519	2,683,589
1999	88	255	2,103,344	33	202	1,079,834	112	457	3,183,178
2000	80	224	1,057,657	31	195	529,733	101	417	1,587,390
2001	68	120	269,982	27	125	345,770	86	243	615,752
2002	49	96	577,726	19	126	314,244	66	222	891,970
2003	29	42	162,757	19	101	258,041	45	142	420,798
2004	39	56	112,899	31	77	275,121	59	120	388,020

[a] Harvest includes reported at-sea discards.

[b] Pooled vessels count is discrete vessels.

Table 19.–Effort and harvest by gear type in the Cook Inlet commercial Pacific cod parallel season, 1988–2004.

			Round weight (lb)				
Year	Vessels	Landings	Jig/troll	Pot	Longline	Net Gear [a]	Harvest
1988	59	213	1,795	21,466	482,365	11,871	517,497
1989	9	21	160	708	35,978	-	36,846
1990	52	127	162	20,244	250,888	107,505	378,799
1991	122	489	17,284	525,774	1,347,759	25,819	1,916,636
1992	190	868	13,995	1,873,717	3,553,709	-	5,441,421
1993	109	427	-	1,336,799	2,316,492	8,454	3,661,744
1994	74	386	5,487	1,290,860	1,386,775	2,440	2,685,562
1995	140	669	3,572	1,721,079	2,250,472	433,528	4,408,651
1996	106	567	25,645	987,626	2,219,948	1,411,726	4,644,945
1997	137	576	37,362	1,114,131	2,049,394	72,354	3,273,240
1998	116	519	42,453	529,355	1,900,375	211,406	2,683,589
1999	112	457	21,331	981,674	2,171,877	8,296	3,183,178
2000	101	417	1,350	770,298	815,742	-	1,587,390
2001	86	243	-	314,098	301,654	-	615,752
2002	65	222	1,397	307,937	582,635	-	891,970
2003	45	142	-	294,630	126,168	-	420,798
2004	62	133	-	360,877 [b]	27,143	-	388,020

[a] Net gear includes trawl and sunken gillnet.

[b] Includes less than 1,000 lb from another gear type.

Table 20.–Commercial effort and harvest for the state waters Pacific cod season in the North Gulf and Cook Inlet Districts, 1997–2004.

	North Gulf District			Cook Inlet District			Pooled Districts
Year [a]	Vessels	Landings	Harvest (lb)	Vessels	Landings	Harvest (lb)	Harvest (lb)
1997	29	81	291,565	35	288	547,348	838,913
1998	28	92	164,540	20	214	565,929	730,469
1999	20	56	359,511	23	274	1,158,396	1,517,907
2000	7	11	19,817	19	320	1,129,971	1,149,788
2001	5	15	60,310	9	194	835,041	895,351
2002	5	7	170,239	12	315	1,158,608	1,328,847
2003	15	41	616,306	14	260	837,232	1,453,538
2004	15	63	938,541	19	228	1,173,144	2,111,685

[a] All harvest totals include reported at-sea discards.

Table 21.–Commercial effort and harvest (lb) by gear type with guideline harvest level (GHL) and percent harvest for the Cook Inlet state waters Pacific cod season, 1997–2004.

	Jig/troll			Pot					Percent
Year	Vessels	Landings	Harvest	Vessels	Landings	Harvest	Total	GHL	Harvested
1997	46	233	561,947	10	136	276,966	838,913	2,549,646	32.9
1998	29	123	188,209	13	183	542,260	730,469	2,434,565	30.0
1999	14	51	127,229	24	278	1,390,678	1,517,907	2,637,445	57.5
2000	5	12	13,885	17	219	1,135,903	1,149,788	2,160,255	53.2
2001	5	13	19,428	9	196	875,923	895,351	1,917,195	46.7
2002	6	15	18,163	9	306	1,310,684	1,328,847	1,571,455	84.6
2003	15	160	429,684	10	140	1,023,854	1,453,538	1,438,516	101.0
2004	18	120	326,298	12	170	1,785,386	2,111,684	2,367,765	89.2

Table 22.–Commercial pollock fishing effort and harvest in the Cook Inlet Area, 1988–2004.

Year	Vessels	Landings	Harvest (lb) [a]	CPUE [b]
1988	6	14	2,380	170
1989	1	3	confidential	confidential
1990	18	35	61,817	1,766
1991	3	3	5,698	1,899
1992	34	43	949	22
1993	33	47	149,875	3,189
1994	24	39	237,429	6,088
1995	22	33	1,445	44
1996	16	33	1,940,506	58,803
1997	25	59	3,870,099	65,595
1998	18	74	9,682,978	130,851
1999	12	24	2,983,234	124,301
2000	4	4	448	112
2001	7	12	3,129	241
2002	7	9	1,381	153
2003	1	2	confidential	confidential
2004	4	7	342,305	48,901

[a] Includes reported at-sea discards.

[b] CPUE is catch per unit effort in pounds per landing.

Table 23.–Average weight, average length, and percent female of commercially harvested walleye pollock in the Cook Inlet Area, 1994–2004.

Year	Average weight (kg)	n	Average length (cm)	n	Percent female	n
1996	n/a		n/a		n/a	
1997	1.5	600	56	598	45	598
1998	2.3	108	56	435	54	418
1999	1.0	124	50	1,226	47	1,218
2000	n/a		n/a		n/a	
2001	n/a		n/a		n/a	
2002	n/a		n/a		n/a	
2003	n/a		n/a		n/a	
2004	0.9	200	44	199	43	199

Table 24.–Commercial effort and harvest of other groundfish species from the Cook Inlet Area, 1988–2004.

			Round weight (lb)						
Year [a]	Vessels	Landings	Flatfish [b]	Sharks [c]	Skates	Other [d]	Octopus	Squid	Total
1988	6	6	2,418	101	275	24	-	-	2,818
1989	3	3	-	234	-	-	-	-	234
1990	15	23	1,353	20	-	936	-	-	2,309
1991	10	12	31,866	-	2,321	40	422	-	34,649
1992	25	35	1,056	1,009	6,004	30	700	-	8,799
1993	20	51	4,560	-	2,967	501	6,461	-	14,489
1994	18	78	4,471	112	68	-	13,550	-	18,201
1995	13	39	283	100	180	6	7,285	-	7,854
1996	48	129	150,651	408	48,405	31	5,205	35	204,735
1997	42	190	51,929	394	22,006	561	25,148	3,972	104,010
1998	46	187	47,874	268	62,381	-	12,914	26,980	150,417
1999	22	129	86,410	6,594	2,679	89	22,052	23,073	140,897
2000	16	138	274	-	66	4	25,104	-	25,448
2001	10	106	31	-	2,709	193	24,406	-	27,339
2002	11	166	416	-	-	-	38,518	-	38,934
2003	13	138	333	-	270	3	28,922	-	29,528
2004	20	143	248	-	18,728	-	35,981	335	55,292

[a] Preliminary data reported through August 2004.

[b] Flatfish includes general flatfishes, flounders, and soles.

[c] Sharks include spiny dogfish, salmon, Pacific sleeper, and unspecified sharks.

[d] Other includes general groundfish, misc. unidentified fish, eel, greenling, and sculpin.

Table 25.–Reported at-sea discards from Cook Inlet Area groundfish fisheries, 1988–2004.

	Round weight (lb)											
Year	Sablefish	Rockfish	Lingcod	Pacific Cod	Pollock	Flatfish	Sharks	Skates	Other	Octopus	Squid	Total
1988												0
1989		18										18
1990	10		1,500			2,899						4,409
1991		27	1,528	200	3,830	60		400	1,610			7,655
1992	57	1,251	4,235	5,489	2,926	19,125	7,948	64,997	570	27		106,625
1993	13		1,180	6,906	4,470	13,396	10,704	43,607	1,900	329	2	82,507
1994	54	76	1,835	173	832	4,284	1,825	34,850	205			44,134
1995	1,000	366	2,950	5,007	1,550	4,387	19,531	34,486				69,277
1996	8,010	5,490	1	14,203	3,153	88,357		12,369	3,759	2,894		138,236
1997					25,000		500	300		10		25,810
1998	4,895	3,672		396	10,451	89,224	4,994	6,090	4,350		1,828	125,900
1999			68		137	241	864	959	1,168		690	4,127
2000	2,448	836	4,746	17,194	167	1,701	17,700	5,454	78			50,324
2001	1,510		7,549	1,253	1	734	23,651	2,709	111	113		37,631
2002	2,147	5	5,688	457	4	428	9,095	1,875	12	4		19,715
2003	3,445	30	3,277	645		206	23,206	2,892	47	1,400		35,148
2004	1,674	60	434	1,008	3	439	49,568	1,898	26			55,110
	Among Years 1989–2004											
Total	25,263	11,831	34,991	52,931	52,524	225,481	169,586	212,886	13,836	4,777	2,520	806,626
Mean	1,579	739	2,187	3,308	3,283	14,093	10,599	13,305	865	299	158	50,414
% of Total	3%	1%	4%	7%	7%	28%	21%	26%	2%	1%	0%	100%

Table 26.–Average weight and percent female of commercially harvested octopus in the Cook Inlet Area, 1994–2004.

Year	Average weight (kg)	n	Percent female	n
1996	n/a		n/a	
1997	n/a		n/a	
1998	n/a		n/a	
1999	n/a		n/a	
2000	10.1	78	62	78
2001	n/a		n/a	
2002	15.5	129	60	123
2003	n/a		n/a	
2004	n/a		n/a	

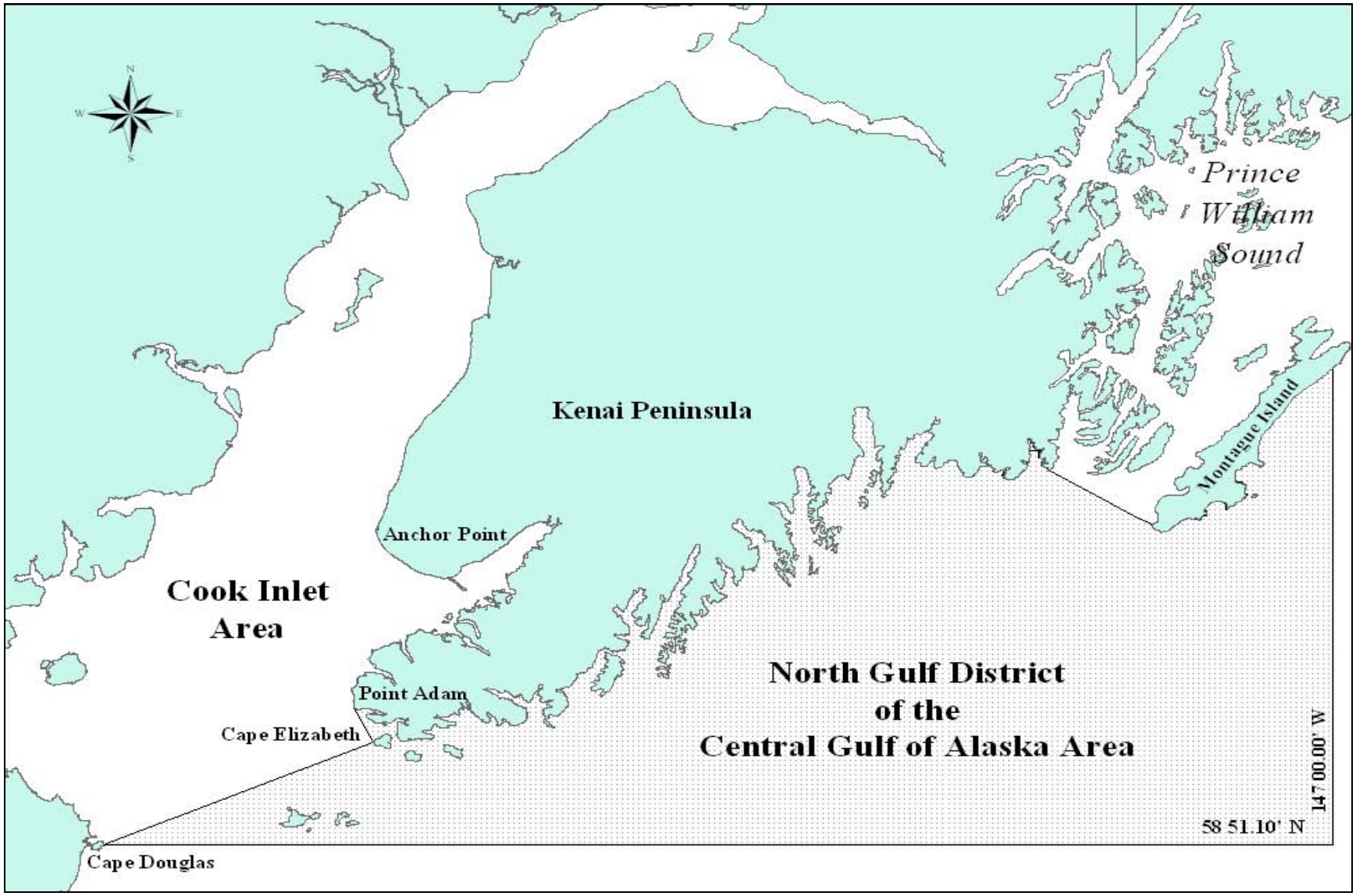

Figure 1.–Boundaries of the Cook Inlet Area and the North Gulf District of the Central Gulf of Alaska Area prior to 1997.

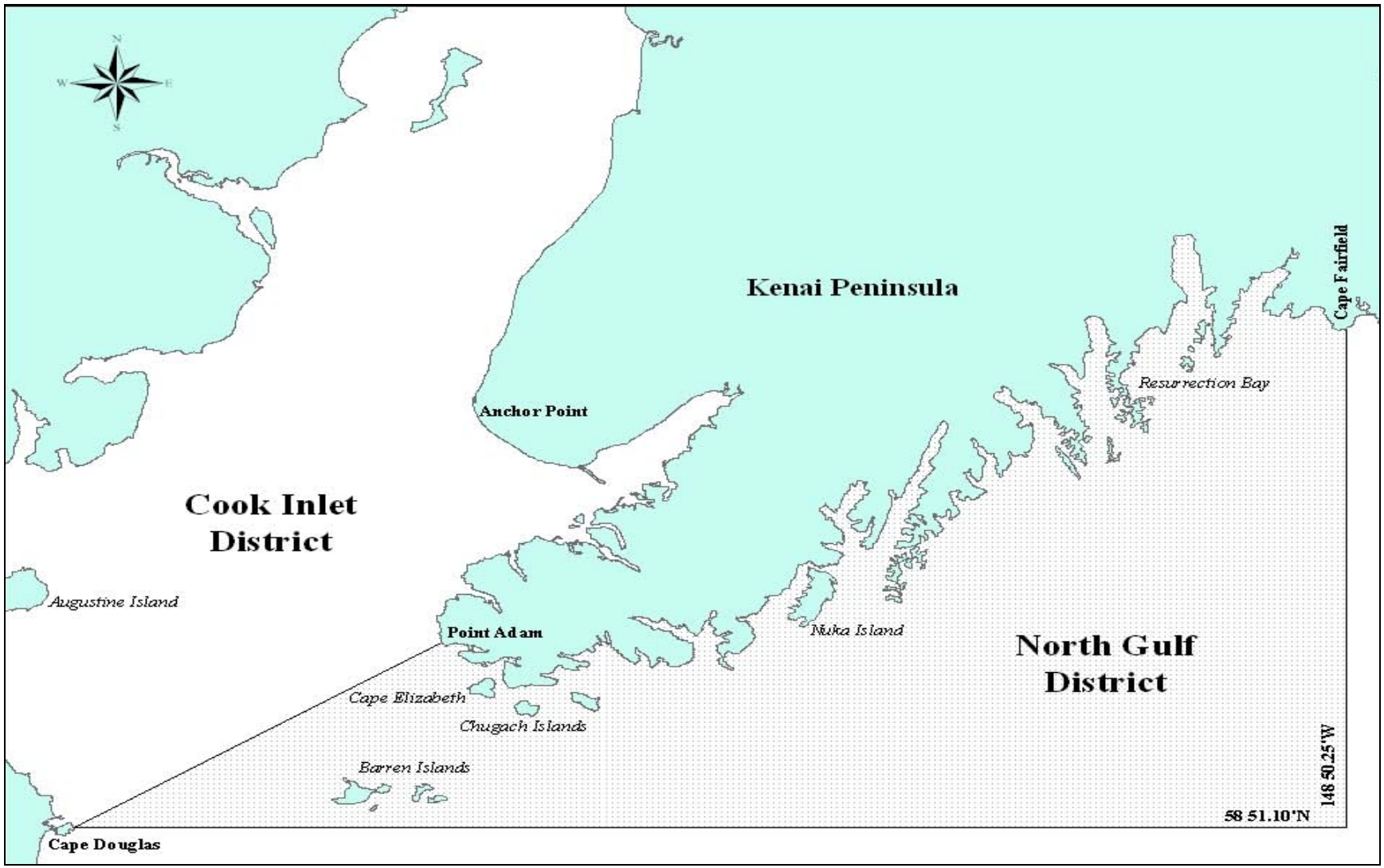

Figure 2.–Cook Inlet Area commercial groundfish area and district boundaries from 1997 to present.

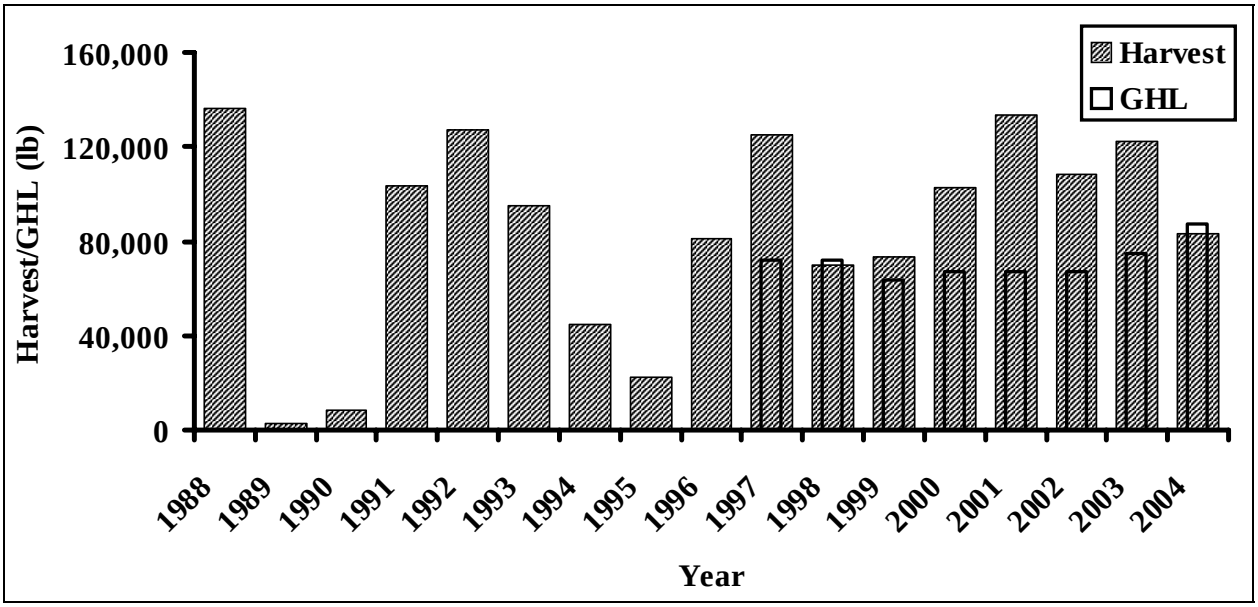

Figure 3.–Sablefish harvest and associated guideline harvest (GHL) level for the Cook Inlet fishery, 1988–2004.

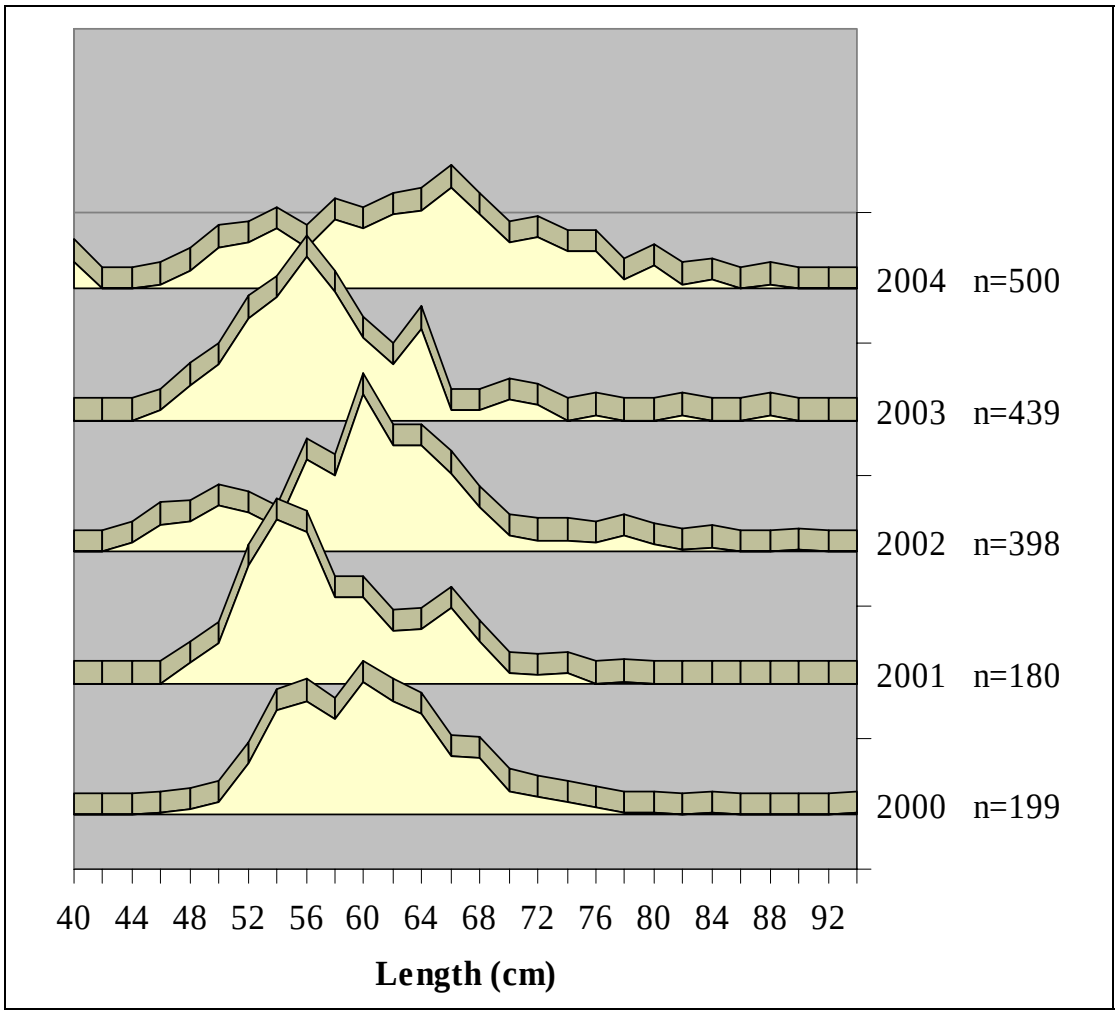

Figure 4.–Cook Inlet commercial sablefish sampled length frequencies, 2000–2004.

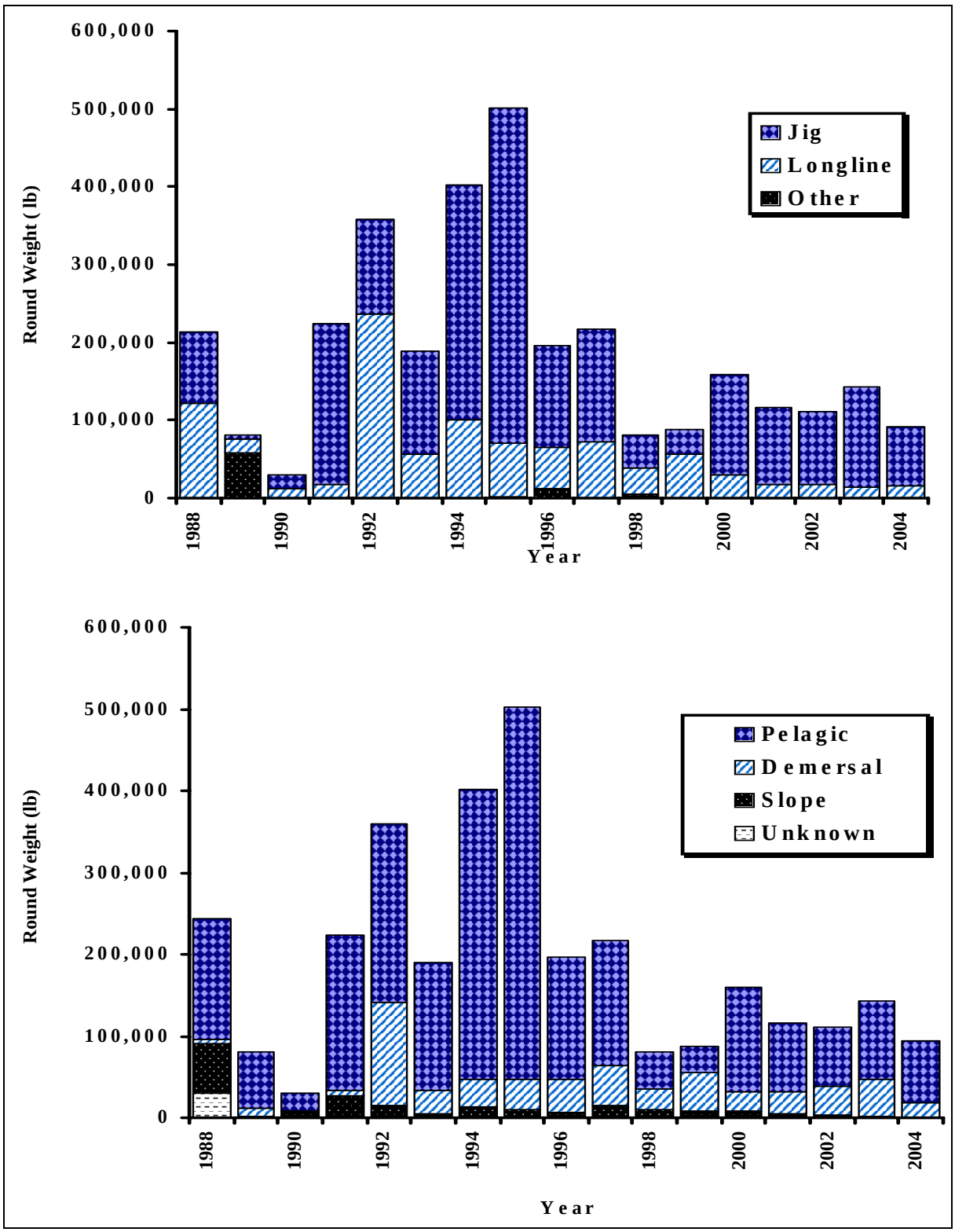

Figure 5.–Commercial rockfish harvest contribution by gear type and rockfish species assemblage, 1988–2004.

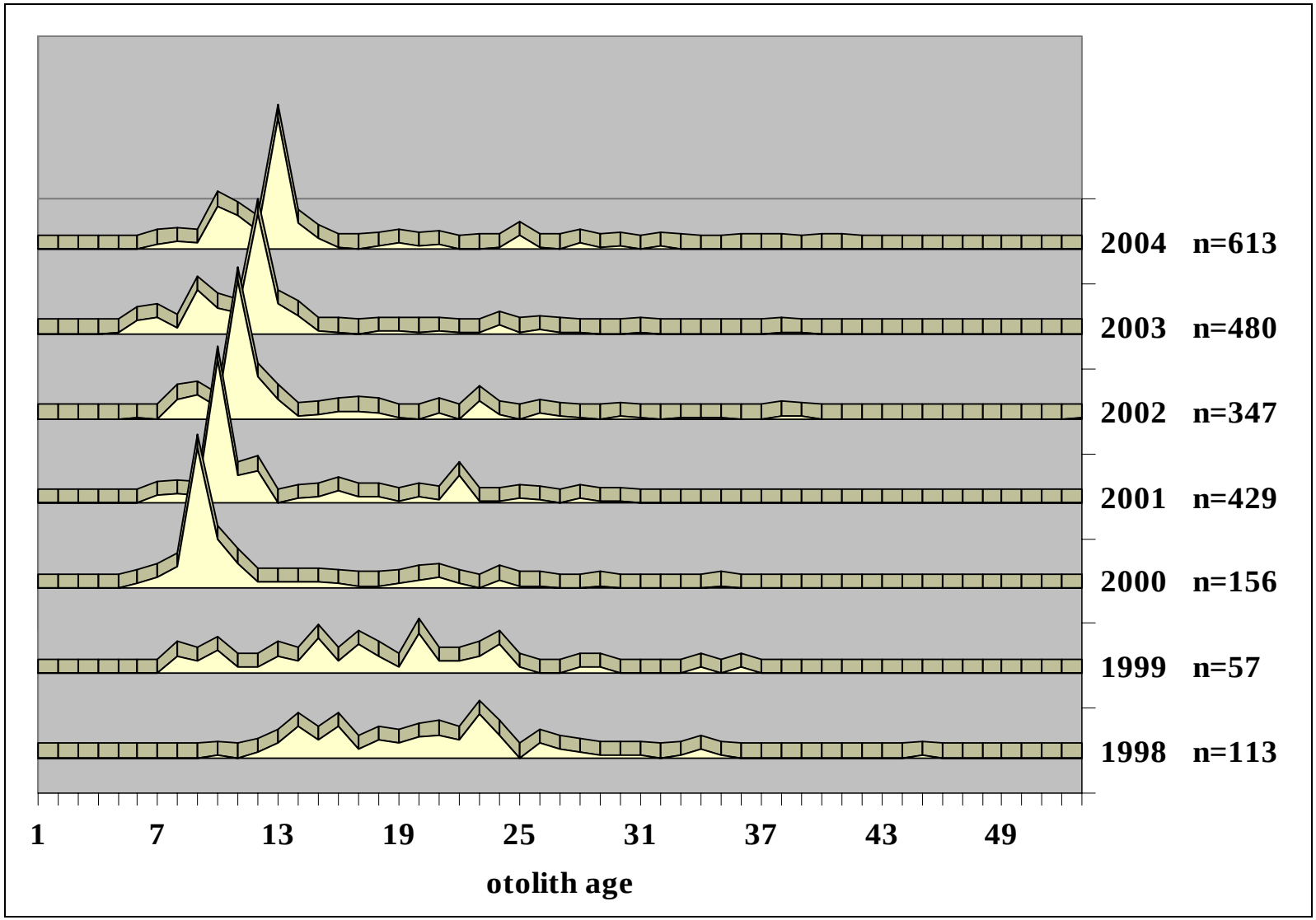

Figure 6.–Age frequency of black rockfish in commercial catch samples from the Cook Inlet Area, 1998–2004.

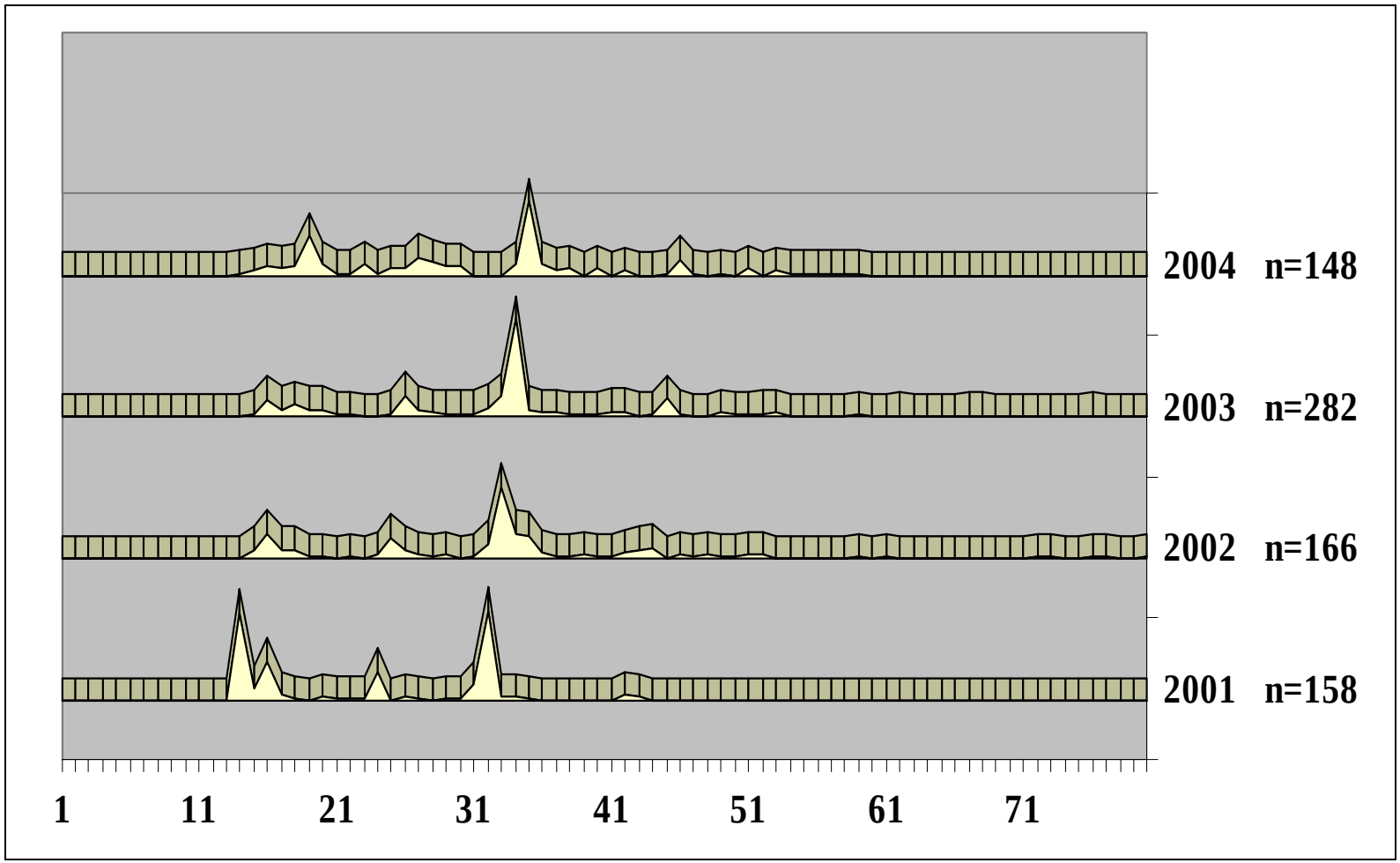

Figure 7.–Yelloweye rockfish age frequency in commercial catch samples from the Cook Inlet Area, 2001–2004.

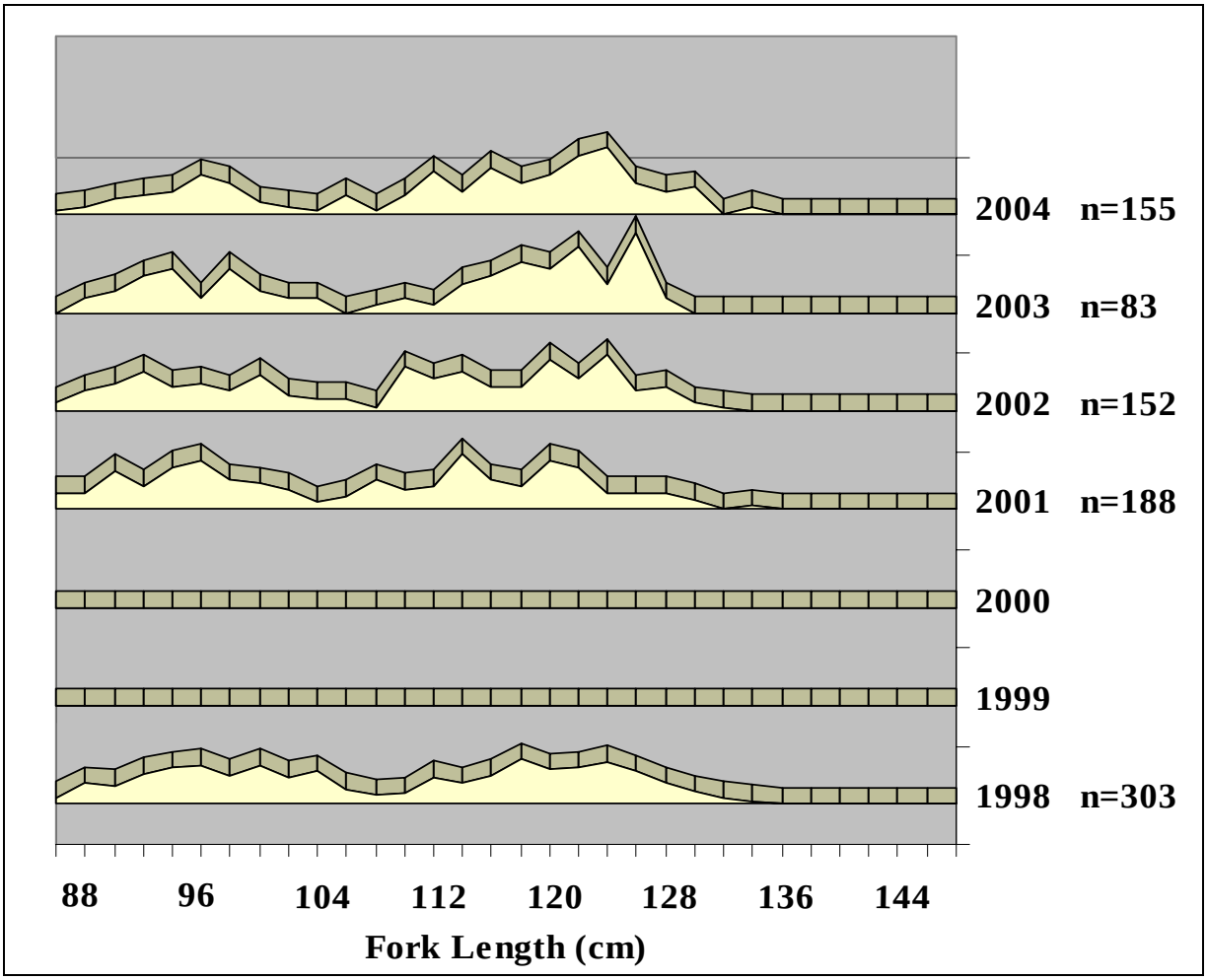

Figure 8.–Lingcod length frequency from Cook Inlet commercial catch samples, 1998–2004.

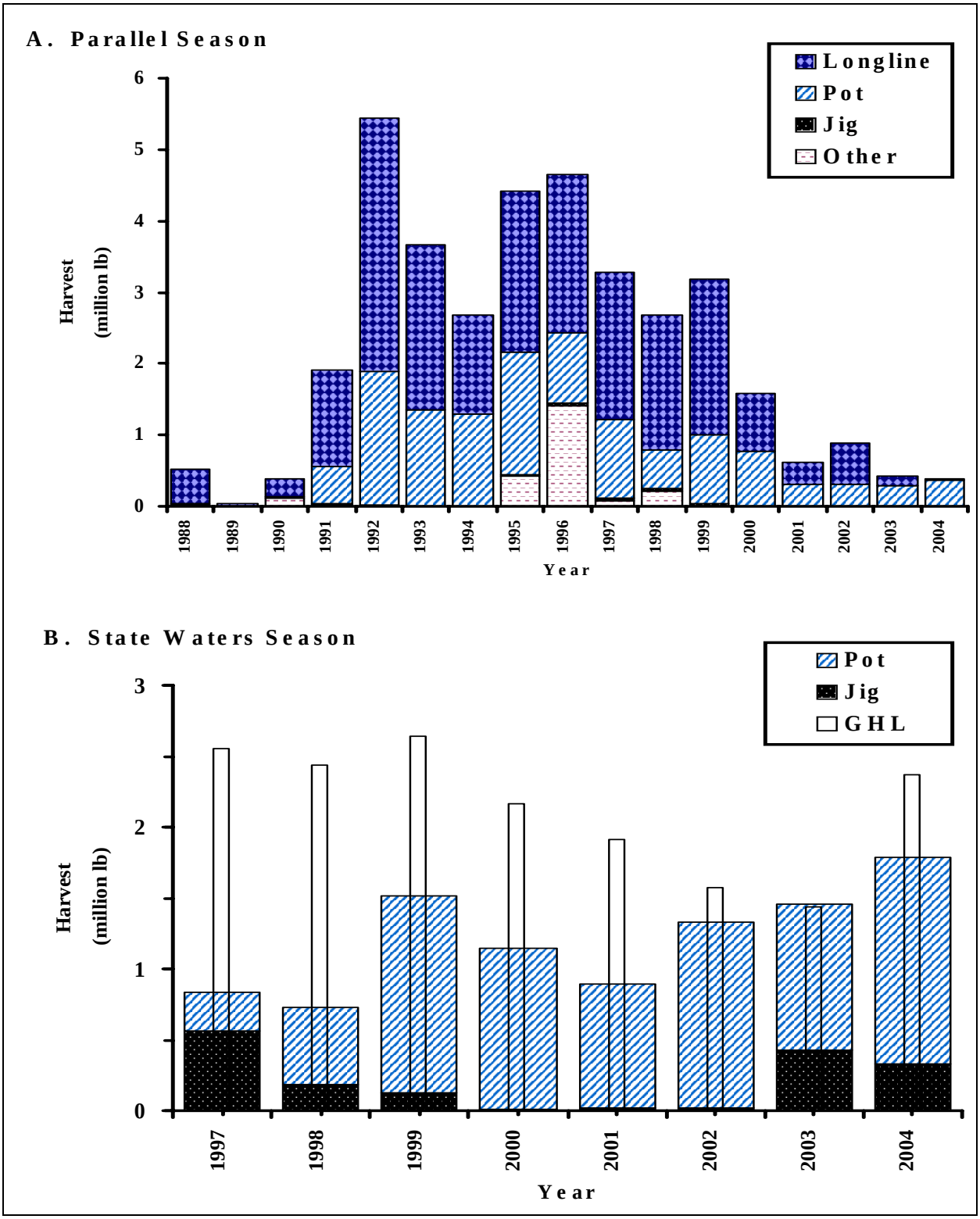

Figure 9.–Pacific cod catch by gear type in the Cook Inlet Area parallel (A) and state waters (B) seasons, 1988–2004.

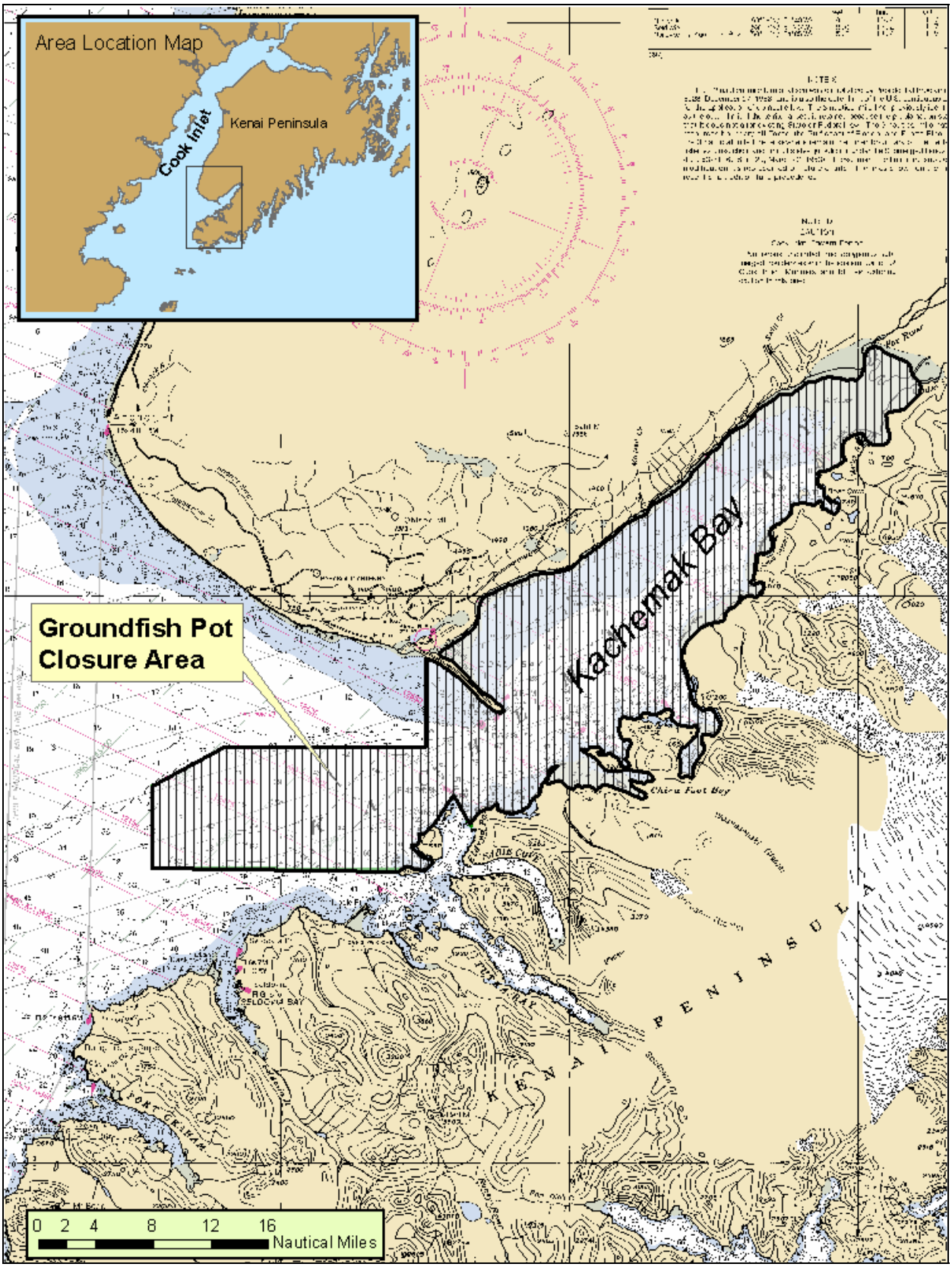

Figure 10.–Kachemak Bay groundfish pot closure area.

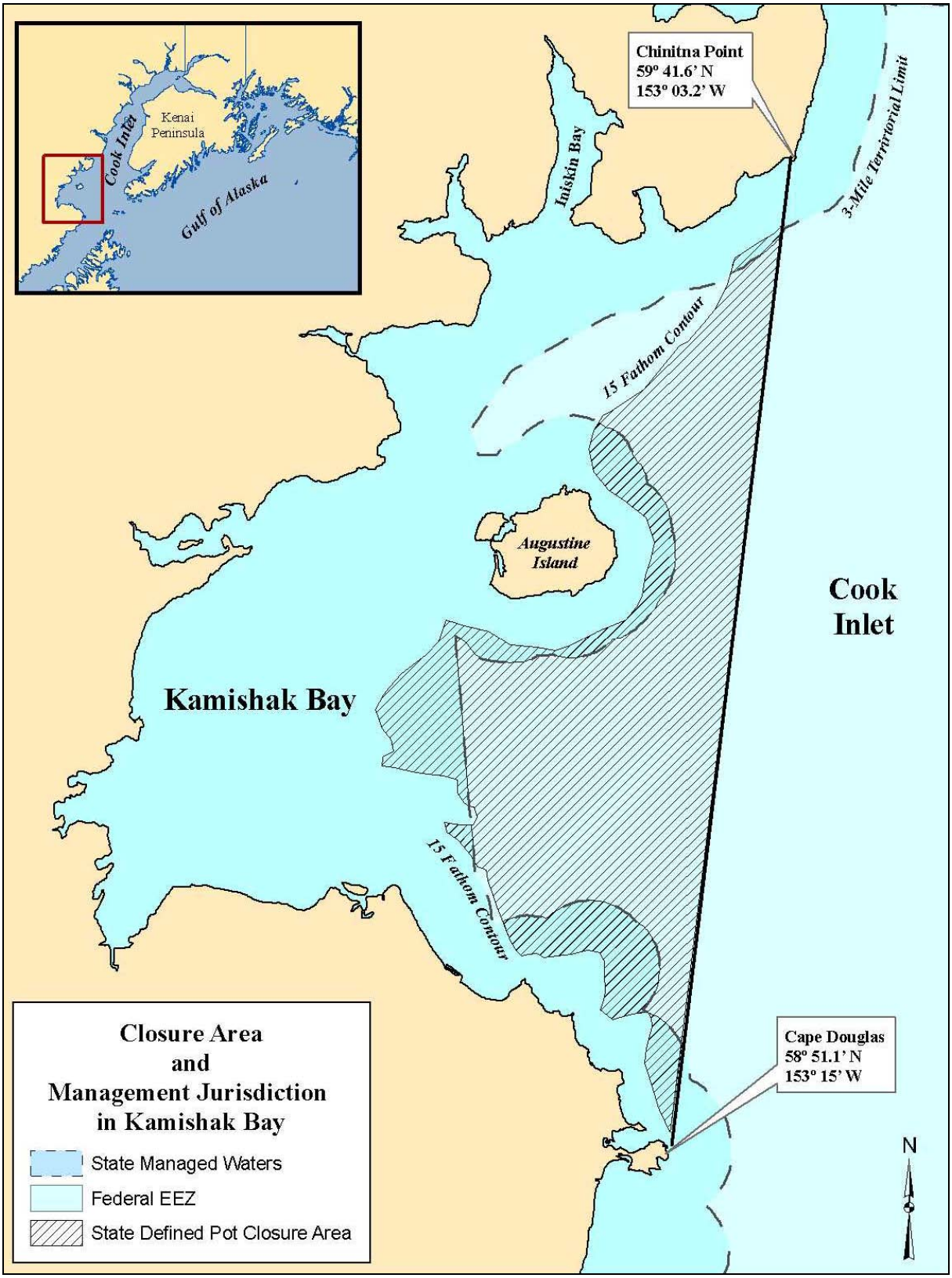

Figure 11.–Kamishak Bay groundfish pot closure area.

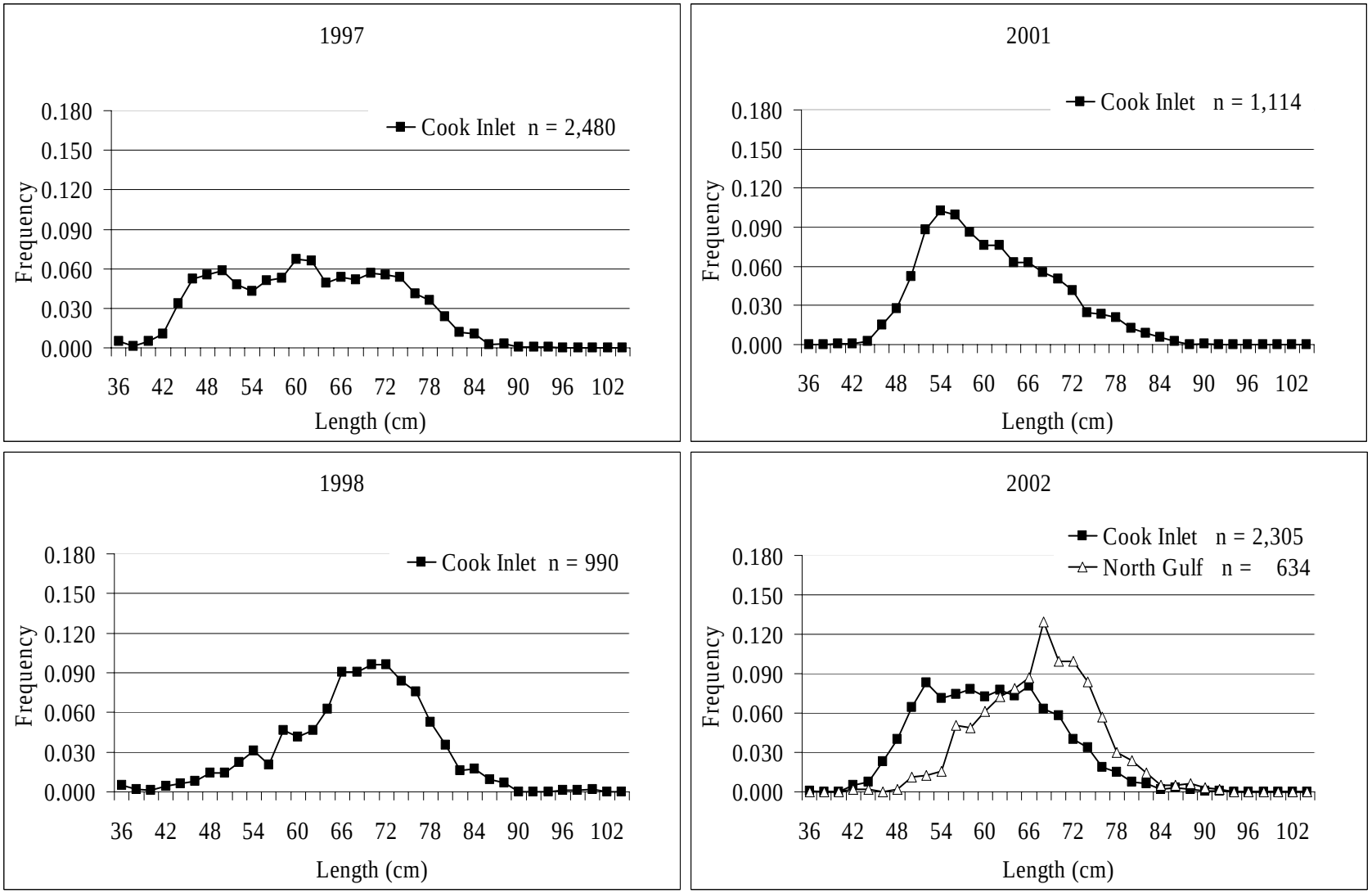

Figure 12.–Pacific cod length frequencies by district from Cook Inlet Area commercial Pacific cod samples, 1997–2004.

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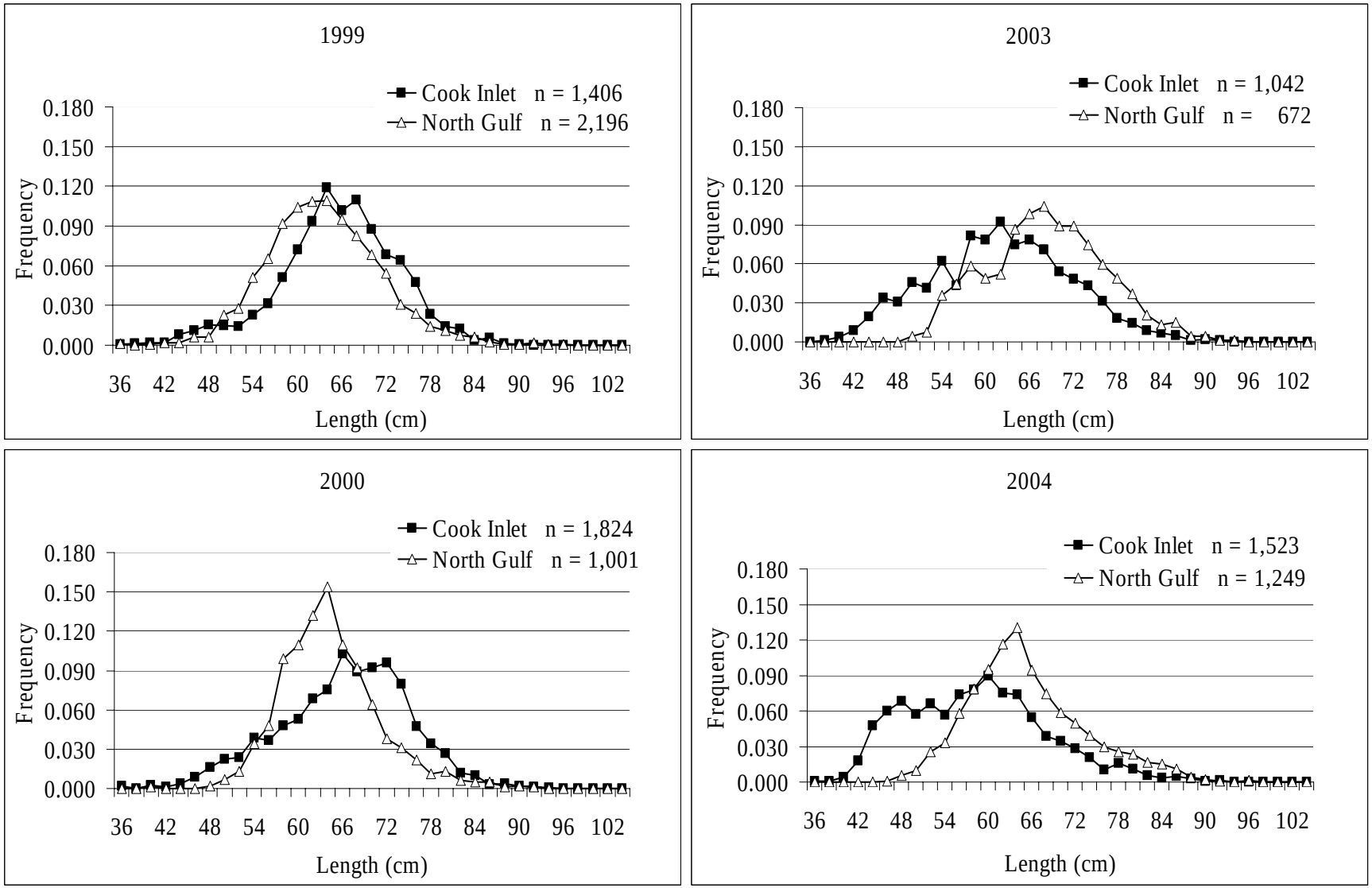

Figure 12.–Page 2 of 2.

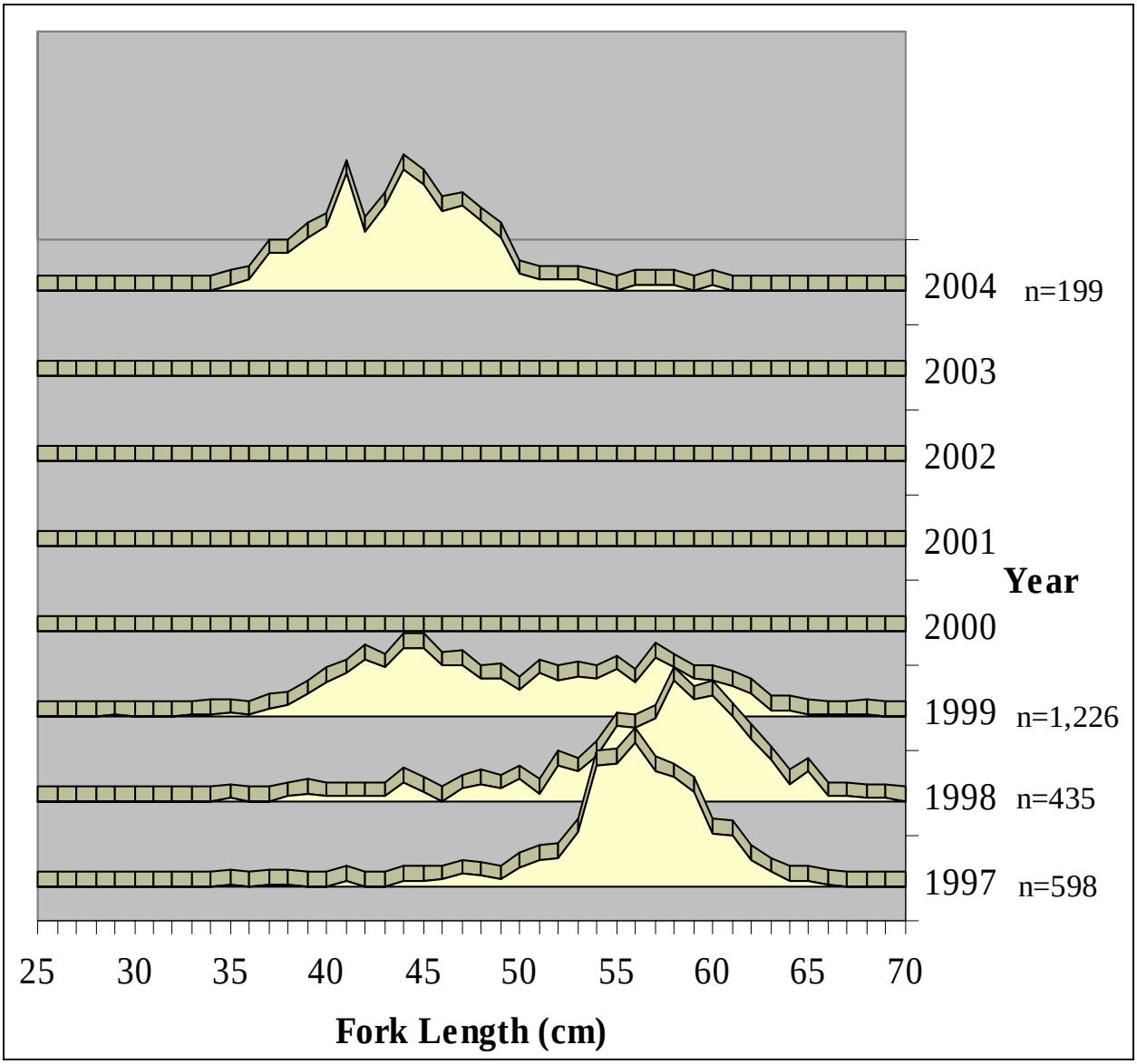

Figure 13.–Walleye pollock relative length frequencies from Cook Inlet Area commercial catch samples, 1997–2004.

APPENDIX A.

Appendix A1.–Frequently used acronyms and key words.

Acronym	Definition
ABC	Acceptable biological catch, stock specification as set annually by the NPFMC.
ADF&G	Alaska Department of Fish and Game
BOF	The Alaska Board of Fisheries
CGOA	Central Gulf of Alaska, management areas 620 and 630
EEZ	Exclusive economic zone, from 3 to 200 nautical miles offshore
EO	Emergency order, management action taken by ADF&G to effect regulatory change
GHL	Guideline harvest level
GOA	Gulf of Alaska
mt	Metric tons (equal to 2,204.62 pounds)
nm	Nautical mile (equal to 6,076 feet)
NMFS	National Marine Fisheries Service
NPFMC	North Pacific Fishery Management Council
Parallel fishery	State waters from 0 to 3 nautical miles opened via EO but with the same gear and seasons that apply to the federal fishery in the adjacent EEZ
State waters	Territorial sea from shore to 3 nautical miles offshore
State-waters fishery	Fishery occurring from shore to 3 nautical miles, open under state rules and managed exclusively by ADF&G
TAC	Total allowable catch, final federal harvest specification as recommended by NPFMC and set by NMFS